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Industrial FINISHING

Published Monthly in the Interest of Modern Industrial Finishing

*Ten Best Finishing Resolutions for ~~1944~~ 1945

1. FINISH HITLER
2. FINISH HITLER
3. FINISH HITLER
4. FINISH HITLER
5. FINISH HITLER
6. FINISH HITLER
7. FINISH HITLER
8. FINISH HITLER
9. FINISH HITLER
10. FINISH HITLER

*Next Best—FINISH your products with LILLY'S DEPENDABLE FINISHES

LILLY VARNISH COMPANY
Indianapolis, Indiana
Branches: Chicago, Ill.; Grand Rapids, Mich.; Gardner, Mass.
THE LILLY COMPANY, High Point, North Carolina

PLASTIC-BASE Paladin

conquers hard-to-finish surfaces

THROUGH THE YEARS the superiority of Roxalin's plastic-base protective coatings has been demonstrated repeatedly by tests like this and proved under rigorous service in the field. In this case, cadmium-plated steel has been half-primed with commercial primer, half with Roxalin's Paladin, followed by a wrinkle enamel top coat. Note how the Paladin anchored system clings to this hard-to-finish surface when gouged by the knife blade.

Inside or outdoors, Paladin can take it. Salt spray, humidity and solvent resistance are inherent in this plastic-base coating. Its super flexibility permits blanking, forming or extruding after finishing. Paladin can help you with your hard-to-finish surfaces. Write to Dept. 801- for information.

ROXALIN *Flexible* FINISHES
INCORPORATED
ELIZABETH, N. J. • NEW JERSEY

ONLY ROXALIN MAKES PALADIN

ANNOUNCING

Enthone ALUMON

for Electroplating upon Aluminum

ALUMON is a simple dip treatment for aluminum that depassivates and deposits an alloy film making the surface receptive to copper The aluminum is cleaned, and then immersed in the Alumon solution at room temperature for about 30 seconds. It is then ready for plating. The copper plate can then be plated with a deposit of any other metal including nickel, gold, silver or chromium.

PATENT PROTECTION is available with the Alumon process but there are no large royalties to pay or licenses to sign.

PLANT TESTED AND PROVED. Alumon is not an untried process but has been used for plating large volumes of important war work for two years. It is now ready for general use—for war or civilian plating.

ALL ALUMINUM ALLOYS PLATED. Minor variations in cleaning and the Alumon immersion time permit all aluminum alloys to be plated; e.g., 2S, 3S, 14S, 17S, 24S, 52 and cast alloys.

BULK TREATMENT IS POSSIBLE for small work to be barrel plated. Large work is handled on racks or hooks.

Working Alumon samples are available or aluminum samples will be plated for inspection and test.

Experienced Plating Engineers are available for consultation for your war or postwar plating problems.

Write for Literature and Operating Directions.

THE ENTHONE COMPANY

CHEMICAL PRODUCTS · ELECTROPLATING EQUIPMENT
441 ELM STREET · · NEW HAVEN 2, CONNECTICUT

ENDURANCE-TESTED FOR 1000 HOURS...

And Still Going Strong!

Sterling 1000 Portable Electric Sanding Machine in the Sterling Laboratory undergoing one of a series of "torture" tests. This machine ran well over 1000 hours with only occasional stops for check-up, oiling and brush changes. Actually no Sterling 1000 has ever worn out. Its estimated life is over 3000 hours.

The men who use the Sterling 1000 enthusiastically praise its performance and design... they *instantly* notice these outstanding qualities. But what the eye *doesn't* see is also extremely important. Master engineering and workmanship *plus* the very best of materials go into each tool. Every part and detail is exactingly built... all sub-assemblies and assemblies are carefully checked and tested. Such refinements *can't* be seen...they are *proved* by the smooth hum of the super-powered motor, by the fast, precise operation and in time, by the unusual endurance and durability.

THE STERLING 1000 REPLACES HAND SANDING... saves countless hours and dollars. Although many users buy it for a specific purpose, they are often delighted to discover that they have a tool which can be used for a wide range of finishing operations. The Sterling 1000 is for all types of sanding (coarse or fine) as well as for lapping and polishing.

See your distributor today or write!

STERLING
1000 PORTABLE ELECTRIC
SANDER

STERLING TOOL PRODUCTS CO.
365 East Ohio Street • Chicago 11, Illinois
Los Angeles and Toronto

TWENTY-FIRST YEAR OF PUBLICATION

Industrial FINISHING

W. H. ROHR, Editor E. A. DOSCH, Assoc. Editor

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Eastern Representative: C. A. Larson, 254 West 31st St., New York 1, N. Y.; Phone Penna. 6-9049

Letters from Readers

Hot Lacquer

Our clients in South Africa have asked us to contact you to learn the names of firms who manufacture hot lacquer. Also, the names of firms who supply installations for the application of this hot lacquer.—E. & McD. (Export Buying Agents.)

Information supplied.— ED.

Paint Mixer

Can you tell us where we can buy a paint mixer? We would like to have one that we can clamp on the side of a tank or barrel, with mixer extending into the paint.—F. B. Co.

Names of several supplied.—ED.

Car Floor Sealers; Toy Finishes

We are interested in an inquiry in your November issue of INDUSTRIAL FINISHING concerning car floor sealers. The item is on page 6, and is signed "P.&V." We are manufacturing this material for several railroads, so perhaps we can be of service to your subscriber.

Also, on page 8 of the same issue, you have inquiries concerning toy finishes which we also manufacture. We would like to contact the concerns interested.—THE P. D. GEORGE CO.

Information furnished.—ED.

Polished Finish on Hardwood

We would like for you to advise us of the best method for obtaining a polished finish, after the final coat of lacquer has been placed on solid mahogany or solid walnut. We would also like to receive your recommendations for producing a dull-rubbed finish on both of the above mentioned woods. In your recommendation we would like for you to tell us the proper type of materials to use and the application, etc.—H. V. Co.

All of your questions are answered in an excellent article entitled "Rubbing Finishes on Wood Furniture," which appears on pages 70 to 73 inclusive in September, 1944 issue of INDUSTRIAL FINISHING Magazine.—ED.

West Coast Flock

Would you kindly advise our Seattle office of the names of companies, preferably those on the West Coast, that manufacture flock, and also the sizing used with flock? Our Mr. X. is putting in a flock gun setup in Seattle, and must locate a source of supply for the flock and the flock sizing.—Y. Co.

We do not know of any flock manufacturers on the West Coast. However, the sizing for flock can probably be obtained from the Pacific Coast branches of several manufacturers of finishing materials who advertise in this magazine.—ED.

Pressed Steel Toys to Finish

I have been loaned several issues of your publication, INDUSTRIAL FINISHING, which I have read with great interest. After perusing your magazine, it is obvious that we have a lot to learn about industrial finishes in this part of the world (New Zealand).

You mention, in numerous articles, the assistance that the paint manufacturers' experts can give to manufacturers (users) as regards the types of finishes to use, drying systems, dipping, whirling, etc., but we have to admit that the N. Z. paint manufacturers or distributors are not very helpful in this regard.

As we can see the end of our essential production, we are now planning to produce pressed steel toys similar to those made by Wyandotte or the Turner Co. in our country.

We are seeking the very latest recommendations on the following points, and are confident that you can obtain descriptive pamphlets from equipment manufacturers, or that you may have special booklets among your publications which would act as suitable text books on the various subjects:

1) Tips on dipping, including data on thickness of the paint, length of dipping tank, draining, baking, cooling, etc. Also suggested methods of constructing the conveyor system. 2)

(Continued on page 8)

☆ AFTER VICTORY

We will immediately have available, all of the products developed in our Laboratories during the past three years.

SAMPLES OF THE FOLLOWING ITEMS ARE AVAILABLE NOW...

NEW:
Synthetic Enamels
Sanding Surfacers
Pearl Essence Coatings
Lacquer Enamels
WRINKLE FINISHES
For wood and metal

IMPROVED:
Vindolux
Wateroil Stains
Comb. Stain and Filler
DuBar Bleach
4500 LACQUER LINE
6400 SEALACQUER

Inquiries invited on any Specification Finish

V. J. DOLAN & COMPANY, INC.

Manufacturers of "UNQUESTIONABLE QUALITY" *Industrial Finishes*

1830 N. Laramie Ave. **Chicago 39, Illinois**

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TORNADO settles your DUST problem

DUST will be LESS of a problem with the TORNADO Portable Electric Blower to blow it out of motors, generators, shafting, bearings, etc. TORNADO blows out dust, dirt, lint—with its swoosh of clean, dry air.

Powerful 1 h.p. universal motor makes it easy to clean largest motors or generators without dismantling them. Plugs in at any electric outlet. Costs less than 3c an hour to operate. Weighs only 14 lbs.

Write for details and FREE TRIAL Offer

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BREUER ELECTRIC MFG. CO.
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The new

High-solids lacquers

save money

High-solids lacquers mean thicker coats . . . therefore fewer coats. This saves you money—in the five ways shown, and perhaps others as well. You can estimate just how large your savings will be when you get the full facts from your own lacquer supplier. Ask him about the *new* high-solids lacquers he is developing.

High-solids nitrocellulose lacquers deposit thicker films at spraying viscosity, give you the same finish with fewer coats.

Nitrocellulose lacquers are still the fastest-drying finish . . . in minutes at room temperature. No expensive baking equipment is needed.

No expensive baking equipment is needed.

You save assembly time with high-solids lacquers. Each finishing operation on assembly line and on feeder lines is speeded up.

One of lacquer's biggest advantages is the ease with which any scratches or imperfections in the finish can be retouched or repaired.

You save on your investment in goods-in-process when you finish in fewer coats. You also save factory space.

High-solids lacquers provide a lifetime finish on metal, fabric, leather, rubber, paper, or glass.

ASK YOUR LACQUER SUPPLIER

for details. Hercules makes no lacquers . . . concentrates on production of highest-quality nitrocellulose and its applications.

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★ Specially formulated for your job under strict laboratory control

★ Dependable, easy working, low cost

★ Unusually attractive and long lasting

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Wear Master

Sealers-Lacquers-Enamels

The SELLING Finishes

STANDARD INDUSTRIAL PRODUCTS, INC.

EVANSVILLE 4, INDIANA

Tumbling and whirling. 3) Infra-red lamp baking. How to wire and install. 4) Cleaning metal of both rust and grease. 5) Water-wash spray booths. 6) Sealing and finishing wooden parts.

Any trade pamphlets could no doubt be posted direct to us by the various manufacturers. We would be glad to be placed on your regular mailing list for INDUSTRIAL FINISHING. Thanking you in anticipation of your valued assistance.—E. T. PRODUCTS, LTD., Wellington, N. Z.

Silk Screen Stenciling

Can you tell us where we can get information about the silk screen process of painting instrument dials, etc?—S. Co.

Information supplied.—ED.

One-Way Windows Again

In the November issue of INDUSTRIAL FINISHING, on page 8, there is an item headed, "One-Way Windows." For many years, we have manufactured a one-way vision screen which has been used especially in schools where observers wish to study children's activities, unobserved.

The screen is made of a 40-mesh or 60-mesh wire cloth. The side of the cloth which is toward the children being observed is painted the same color as the walls of the room (usually white or some light tint); the other side is black.

The observers are in a darkened room which is on the black side of the screen. From this position, they can observe the children and hear them without being seen or heard themselves. We usually mount this cloth in a wood or metal screen frame. We are sending you two samples of this cloth because we thought you might be interested in it.—KANE MFG. CORP.

Bleaching Out Streaks

One of our furniture customers has written to ask us about a process of bleaching mineral streaks on 2-tone birch and maple by using a coat of light material on the wood and then sand-blasting. Do you know about such a process? We would appreciate hearing from you on the subject. —R. Co.

We have never heard of sand-blasting being used for this purpose. When dark colored streaks stubbornly refuse to be bleached, finishers often resort to the use of a pigment material of a color or tint that matches the surrounding bleached or light col-

PERFECTION FLAT FINISH
TRANSPARENT AS *Clear Glass*

REVEALS FULL BEAUTY
NO CONCEALMENT—NO DISTORTION

● Notice how the glass covered with conventional flat finish (gloss varnish with stearates or other foreign flattening agents) masks and distorts the beautiful girl in the picture. This same degree of concealment and distortion occurs when ordinary flat finishes are applied to furniture surfaces.

What a difference when Perfection Flat Finish is applied! A unique product of synthetic chemistry—perfectly clear, free of distortion—Perfection Flat Finish brings out the utmost beauty of wood grain and stain.

Waterproof, liquor-proof—free from orange peel—durable and economical—Perfection is best by every test. Let Perfection Flat Finish prove its outstanding superiority—right in your own plant. Perfection Flat Finishes are available in a full range of long-lasting sheens.

PERFECTION
PAINT & COLOR COMPANY
Indianapolis, Indiana

RUST is a ROBBER!

You take protective measures against theft for your valuable equipment. Don't let *rust* ruin it right under your nose! You can STOP destructive corrosion easily, economically, positively—with TECTYL. Easy to apply and remove, Tectyl *seals* metal surfaces against moisture for as long as two years. Write us your special corrosion problem right now—we'll send you a Tectyl bulletin with complete application data.

TECTYL
STOPS RUST
VALVOLINE OIL COMPANY
456 Culvert St. Cincinnati 2, Ohio
Refinery at Butler, Pennsylvania
General Offices, Cincinnati Ohio

PRESTO
EST. 1915

"CLEAN TO THE SURFACE"
FAST — CLEAN — SAFE

FIREPROOF REMOVER

Patty Fireproof remover is the safest material obtainable for shops that have refinishing of furniture. Whenever removing of old surfaces is necessary eliminating all fire hazards use Patty Fireproof remover.

PRESTO LIQUID REMOVER

Presto Liquid Remover is fast acting, (clean cutting), liquid remover which completely destroys the old film within 20 minutes of application. After washing the old surface, refinishing then commences from an absolutely clean foundation.

PRESTO CREAM REMOVER

Presto Cream Remover, fast acting paste remover with heavy body which can be used on both horizontal and vertical surfaces without loss of penetration due to fluidness of ordinary liquid remover.

PATTY REMOVER AND CHEMICAL CORP.
16 Gay Street Manhattan 14, N. Y.

ored wood. Used sparingly and skillfully with a touch-up spray gun, this treatment generally serves the purpose reasonably well.—ED.

Paint for High Heat

Will you please give us promptly the street address of The Quigley Co. of New York City? Your cooperation will be appreciated, for we are keenly interested in obtaining complete information on paint especially designed to stand up under temperatures of 2500° F., as mentioned in November 1944 issue of your magazine.—W. DOOR CO.

It is 58 W. 45th St.—ED.

Flow Coater

Some time ago I saw advertised in your magazine a centrifugal pump to spray stain over furniture. I think this company was in Chicago, but do not remember the name of the company. If you can give us the name and address of the company that makes these pumps we would appreciate it very much.—S. W. Co. (Furniture).

We regret that, because of the large amount of our equipment being required in the war effort, it has been necessary for us to discontinue manufacturing this unit, at least for time being.—SWABY MFG. CO., Chicago.

Wrinkle Touch-up Paint

We are interested in obtaining information on an air dry, black wrinkle paint to be used for touch-up work with paint, such as Sherwin-Williams "Art Metal Dull Black Wrinkle Finish." We would appreciate it if you could tell us where this type of material may be obtained.—C. MFG. CO. (Electro-Mechanical Devices).

While quick-drying air-drying wrinkle compositions were produced in the past, the present day limitation on materials makes it impossible to manufacture such products. With the end of the war, and a general availability of necessary raw materials, it will become possible to manufacture such products again.

In any event, it is advantageous and desirable, in order to obtain uniformity of textures, that touching up be done with the same material as that originally employed and under the same general conditions of application. If a baking wrinkle coating was originally employed, the same material may be employed for touch-

(Continued on page 106)

STILLE-YOUNG

quality standards have been
maintained or advanced—
even under war conditions—
even in the manufacture of
"emergency" products.

MANUFACTURERS

Lacquers Fillers Stains

Enamels Paints

☆

Stille-Young

2300 North Ashland Avenue • Chicago 14, Illinois

Do you know...?

Quiz on timely production short-cuts—No. 11

Q. At war's end, the demand for new automobiles will total:

☐ 5 million ☐ 8 million ☐ 12 million

A. Twelve million—assuming the war lasts another year. However, only about two million new cars can be produced the first year, so great are problems of reconversion. Because so many industries today face reconversion problems, there is a steadily growing demand among business executives everywhere for an interesting booklet just published entitled,, "A New Tool for Industry." This booklet shows how Permacel Industrial Tapes help speed work and cut costs all along the production line. Illustrates many tape uses that may be helpful to you during conversion and after. Write for your free copy today. Dep't IF-11, Industrial Tape Corporation, New Brunswick, N. J.

Q. First postwar airliners will fly from London to New York in:
☐ 4 hours ☐ 10 hours ☐ 16 hours

A. Ten hours. To protect the gyroscope motors which guide big planes and other vehicles, a special Permacel glass tape (Glasflex) is often used. This tape helps prevent electrolytic corrosion, prolongs motor life, increases safety of passengers and crew.

Q. Prisms used in periscopes serve to:
☐ Bend light ☐ Cut glare
☐ Filter colors

A. Bend light. In a tank periscope, prisms enable the driver to see the target without exposing himself. In grinding prisms, Permacel moisture-proof cloth tape (Utilitape) protects polished surfaces exposed to a chemical bath. (One manufacturer cut rejects from 60% to 15% by using this tape.

Q. How many rivets in a Flying Fortress?
☐ 1,000 ☐ 50,000 ☐ 350,000

A. About 350,000. To speed riveting, many manufacturers use Permacel pressure-sensitive tapes. Cold flush rivets are held in place by Permacel's companion, Texcel cellophane tape, while operator works down the line. This eliminates delays, prevents rivets from falling out due to vibration, cuts costs.

IMPORTANT: *Our research laboratories are at your disposal for development of special tapes to meet war or postwar needs.*

Permacel Industrial Tapes

INDUSTRIAL TAPE CORPORATION · New Brunswick, N. J.
Makers of Texcel Tape "PERMACEL" REG. U. S. PAT. OFF.

Coat INTERIORS and BASES of SILVER CHESTS *with*

Cellusuede FLOCK

The rich, brilliant colors and velvety texture of Cellusuede Flock provides both beauty and protection for silver chests and their contents. A trial application will show you how quick, simple and inexpensive it is to enrich your product and greatly increase its sales-appeal. Both Cotton and Rayon Flock are available for immediate delivery in a wide assortment of standard colors. Special colors matched to order.

Write for Color Card, Prices, Samples and Booklet Explaining Uses and Methods of Application.

CP *Cellusuede Products, Inc.*
ROCKFORD, ILLINOIS

Satisfaction Is Yours When You

buy and use Walker Finishes! Many outstanding factory-tested items to meet normal product finishing needs, coupled with laboratory facilities and expert chemists to formulate special finishes when required. A trial will prove convincing.

"Call on Walker"

H. V. WALKER CO.

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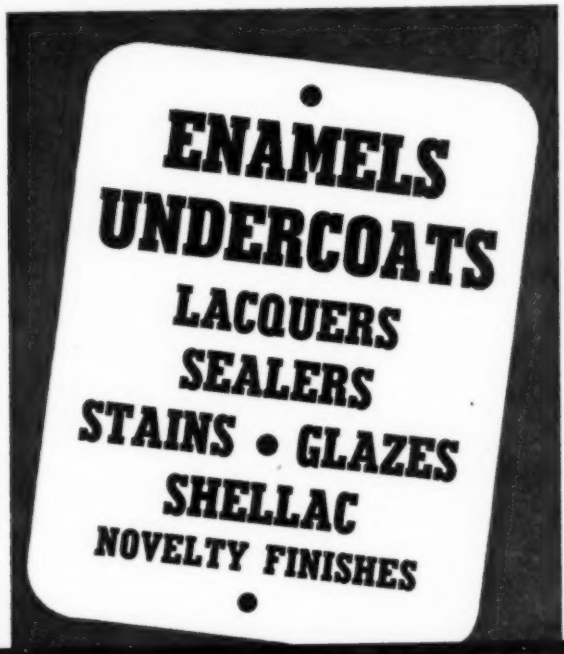
MODERN PRODUCTION FINISHES



IN STEP WITH THE TIMES

Industrial Finishes

that make the most of available raw materials to give you greatest durability, together with attractive appearance and economy.

• FOR APPLICATION BY ALL METHODS

JAMES B. DAY & CO., CHICAGO

TO AIRPAINT THOSE WAR AND POST-WAR PRODUCTS, PICK PAASCHE

A 5-POINT FAVORITE with Finishing Men!

PAASCHE "CU" *High Production* AIR BRUSH

1—*FASTER—uniform, complete coverage at top speed.*
2—*Easier-Handling due to light weight, perfect balance, comfortable grip.*
3—*Finer Atomization under complete control.*
4—*Sturdier construction.*
5—*Most adaptable, due to Multipleheads.*

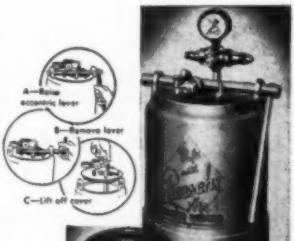
Fastest method of applying finishing materials is one of the chief reasons this Paasche "CU" Airbrush has the preference in factories, shipyards, on maintenance work, etc.

Lightning-Fast **Pressure Feed Material Tank**

with "Clamp Tight" Cover (Off in 5 Seconds)

Save hours in finishing material handling. No bolts or nuts; no wrench needed. Single lever loosens "Clamptight" Cover, or tightens it securely for instant use. Combined with Paasche Airbrush, makes complete high production Airpainting Unit.

For details on the full line of Paasche Pressure Feed Tanks, Compressors, Air Regulators, and Manual or Automatic Airpainting Equipment, write for complete Paasche Catalog.



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PAASCHE AIRBRUSH (Canada) LTD.
110 Elm St., Toronto

TWO WAYS TO FINISH THE JOB *FASTER*—Buy *Extra* War Bonds. Airpaint with Paasche.

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FIRST THINGS
Must Come 1st

The war must be won before any activity is started that can possibly delay Victory by an hour. However, all authorities . . . in the government, in the military forces and business . . . recognize the need for advance planning if industry is to be successful in converting quickly to post-war production on a scale large enough to provide ample employment to sustain a high standard of living. If your plans for the post-war entail a new or unusual finishing problem . . . or an opportunity to profit from advanced, time-saving methods of application . . . our Research Division can help you with valuable suggestions *now*. Just as in the speedy conversion to war production, it helped many important suppliers of war goods get started . . . producing faster and better. Your inquiry will be held in confidence and entails no cost or obligation.

★ F-S ★

THE FERBERT-SCHORNDORFER CO.

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THE NEW IMPROVED Infra-Red DISCOVERY...

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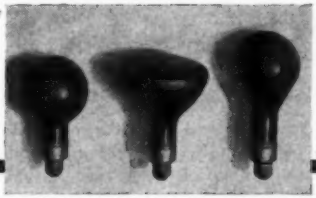
for better, faster, cheaper, easier baking, drying and dehydrating



Literature will be sent or factory sales engineer will call upon request

1- Penetray's exclusive amber ceramic coating improves wavelength, producing more intensive color, thorough curing and superior polymerization.

2- Glare is minimum and reduced insect attraction insures cleaner work.

3- Energy distribution uniformity permits of lower wattage on many types of work.

4- Your own testing is invited. In metallic finishing compare gloss and color; make corrosion and abrasives tests.

LEARN TO SAY PENETRAY

VERD-A-RAY

MONARCH

Lacquers for Industry

FINISHES FOR EXPERTS—
BY EXPERTS—

LACQUER RUBBING COMPOUND

• No matter whose lacquer is used the industrial finisher desires at all times to get that soft sheen that is only obtained by rubbing down the finished surface with a lacquer rubbing compound. No finer product of this kind is available than manufactured by MONARCH LACQUER CORP., under the seal of the "LION" and "M."

LACQUER SPOT PUTTY

• Processed in Gray and White. Used to fill indentations and generally smooths surfaces that are to be sprayed with opaque lacquer and enamels. Monarch Spot Putty will not raise nor shrink but leaves a clean surface which will give a finer, glass-like surface to which top coats easily adhere.

MONARCH LACQUER CORPORATION

19 GAY ST., MANHATTAN 14, NEW YORK

Protective . . .

Decorative . . .

Attractive . . .

WRINK-ALL

MADE from non-critical materials in fine, medium or course texture. A proven product that has received wide acceptance by manufacturers everywhere.

WRINK-ALL has all the characteristics of old type wrinkle in appearance, uniformity, application, baking schedules, etc. Works well under severe conditions in foul ovens. It is available in all shades and colors, and in unlimited quantities for immediate delivery.

NO PRIORITY REQUIRED

[*Order 5 gallons of Wrink-All today and give it a severe production test.*]

LACQUERS—THINNERS
METALLIZED FINISHES
SYNTHETICS AND
SPECIAL COATINGS
FOR ALL SURFACES

United Lacquer Mfg. Corp.

General Offices, Laboratory, Factory: LINDEN, N. J.

NEW ENGLAND MFG. DIVISION, EVERETT, MASS.

BACK THE ATTACK! **BUY WAR BONDS!**

QUALASOLE

America's finest

Padding lacquer

The Gem of Lacquer Finishes

Ask for the Booklet

"The Finish of Your Lacquer Problem"

QUALATONE PRODUCTS, INC.

21 GAY STREET NEW YORK 14, N. Y.

ONCE OVER . . .

One application of Hot Lacquer gives a tough, heavy finish . . . saves applying an extra coat. Heat, instead of thinner, reduces Hot Lacquer to spraying viscosity, allowing 50% to 60% more film-forming ingredients than are contained in room temperature lacquers. Easy to apply—quick to dry. Ask your supplier about lacquer—the postwar finish on today's products.

C.S.C. makes no lacquers or thinners but supplies solvents and plasticizers to manufacturers of protective coatings.

CSC

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ACID AND ALKALI RESISTANT

PROTUX

RAPID AIR DRY OR BAKING

•

CLEAR OR PIGMENTED

•

FOR USE ON METAL, CLOTH, PAPER, WOOD OR PLASTICS, ETC.

Tough • Hard • Flexible

NO OIL — WHOLLY SYNTHETIC

A. C. HORN COMPANY

PRODUCTS FINISHING DIVISION

LONG ISLAND CITY 1, NEW YORK

CHICAGO • HOUSTON • LOS ANGELES

THE ARMY AND NAVY "E"

Many hundreds of American firms have won the "E" award for their great achievement in speeding up production of war materiel.

L-MAC-E has worked hard to supply hundreds of "E" firms with their demands for war and protective coatings, all laboratory controlled, to meet war production specs. Space limitation permits the mention of only a few items.

U. S. ARMY ORDNANCE SPECIFICATIONS

U. S. Army—3-171 Rust Inhibiting Primer K-126
U. S. Army—3-172A Refinishing Primer K-191
U. S. Army—3-173 Lusterless Olive Drab Enamel E-110
U. S. Army—3-174 Semi-Gloss Olive Drab Enamel
ES-680a, Class 101, Rust Inhibiting Primer K-126
ES-680a, Class No. 204, Lusterless Olive Drab Enamel E-110
ES-680a, Class No. 102, Refinishing Primer K-124
ES-680a, Class No. 637, Thinner T-92
ES-680a, Class No. 638, Clear Wood Sealer
Type No. 1, Rot Inhibiting (1 hour dry and slow dry)
Type No. 2, Non-Inhibiting (1 hour dry and slow dry)
Primer, Synthetic, Refinishing AXS-751; Blue Drab Stencil Paint AXS-753
Enamel, Olive Drab, Synthetic, Lusterless AXS 752

The above specification materials are used on a great variety of war products such as large guns, tanks, trucks, wooden chests, etc., for Ordnance and Signal Corps.

U. S. ARMY SPECIFICATIONS

3-106-E Seal Brown Acid Resisting Finish No. 16957
3-106-E Dark Seal Brown Acid Resisting Finish No. 16957-D
These materials are used on Army cartridge crate cases and may be reduced from two to three parts with V M & P Naphtha to one part of the finish.

U. S. NAVY

No. 84a Zinc Chromate Primer K-125
No. 57-B-22 Boxes; Boat, Empty, E-109
Navy Blue Crate Paint E-111
Navy Blue Crate Paint E-115
TT-V-121a, Spar Varnish No. V-587

Navy Blue crate paints are being used on Navy crates where no definite specifications are required. The Spar Varnish will pass all the required tests.

AERONAUTICAL SPECIFICATIONS

Sealer; Wood, Liquid, AAF Spec. No. 14113
Surfacer; Wood Liquid, AAF Spec. No. 14115
Bakelite Varnish; Army-Navy Spec. AN-TT-V-118

FEDERAL SPECIFICATIONS

TT-V-81a, Aluminum Mixing Varnish No. V-569
TT-V-71a, Interior Varnish Type No. 1, Type No. 2
TT-S-176, Class No. 1, Clear Floor Sealer No. V-582, Class No. 2, No. V-583
These materials will meet all of the Federal Specification requirements.
We also manufacture a considerable number of other U. S. Navy-Army and U. S. Maritime specification materials.

THE LAWRENCE-McFADDEN CO.

Headquarters for Fine Finishes Since 1875

Celanese* Chemicals

Celluflex and other Celanese organic phosphates, depending on the requirements, are major plasticizer components of the protective coatings on the wiring systems of naval craft. Celluflex contributes characteristics of flame resistance, moisture resistance, lightness, toughness and flexibility to the intricate maze of electrical cables.

CELANESE CORPORATION OF AMERICA

Practical research goes beyond actual application . . .

FOR ITS PRODUCTION of organic chemicals, Celanese is now drawing on additional sources of raw material supply. This has been made possible by the development of new and original processes for the manufacture of organic phosphates from petroleum base products.

Celluflex*, the newest member of the Celanese family of organic phosphates, is characterized by lower specific gravity, higher viscosity and boiling point, and lower solvent power. Celluflex is used in higher percentage for plasticizing resin and cellulosic films than was feasible with other cresyl phosphates. Its lower solvency permits the incorporation of higher plasticizer content, thus Celluflex increases the tensile strength of film, eliminates tackiness, reduces film flammability and has no tendency to exude. The lower surface tension and higher viscosity of Celluflex contributes to its pigment dispersion ability, solving problems of that nature.

Like all the other Celanese organic phosphates, Celluflex is stable, odorless, non-flammable, non-oxidizing, non-volatile, and non-corrosive. It is valuable as a lubricant and as a lubricant additive for many vital applications from aviation motor oils to lubricants for delicate instruments. Complete miscibility of all these compounds with one another permits a wide range of adjustment or combination of properties to make these materials even more adaptable.

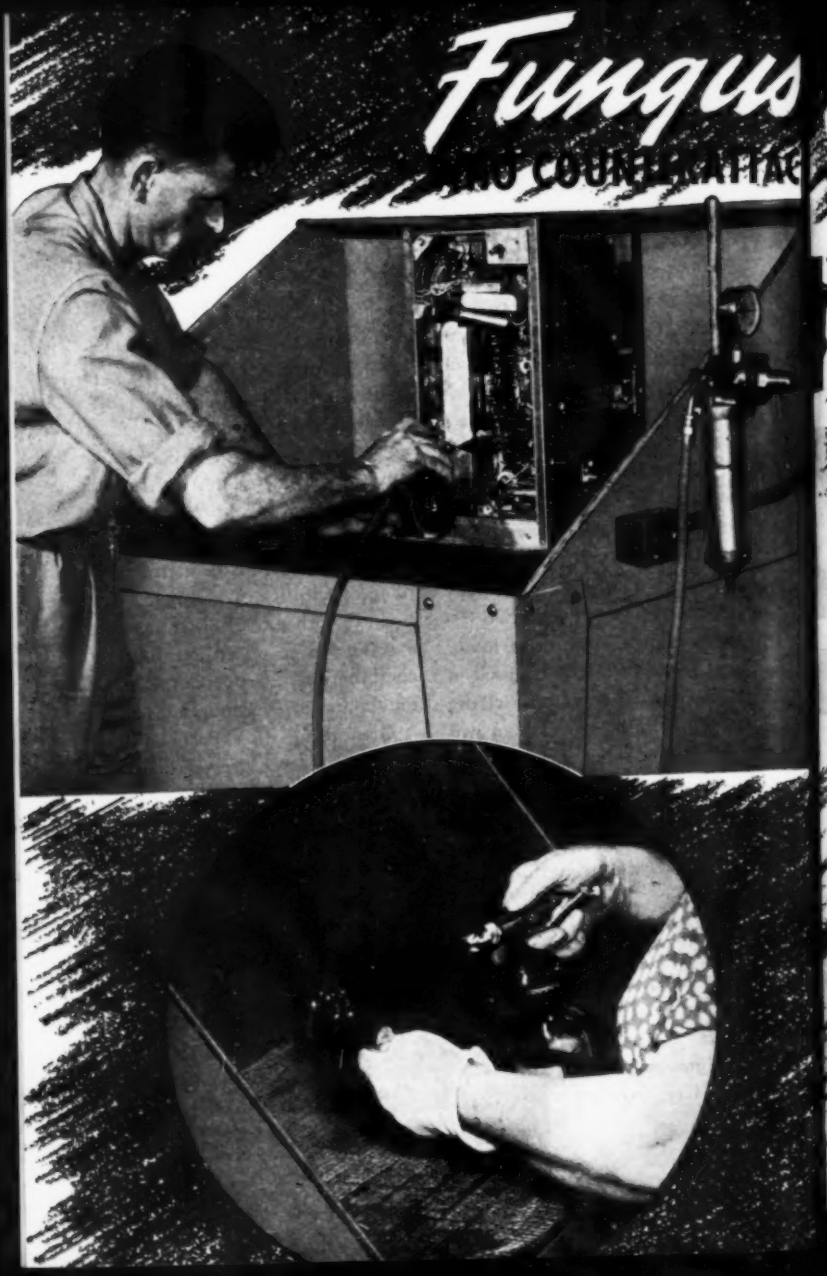
Great things are expected of synthetics, and ever greater demands will be made of the industry producing and fabricating them. As difficulties come up, you will find our research staff eager to make your problem their problem, and to assist in achieving your objective.

PLASTICIZERS
ORGANIC PHOSPHATES
LUBRICANT ADDITIVES
INTERMEDIATES
DYE-STUFFS

Celanese Chemical Corporation, *a division of Celanese Corporation of America,* 180 Madison Avenue, New York 16, N. Y.

*Reg. U. S. Pat. Off.

TEXTILES • PLASTICS • CHEMICALS


Fungus
COUNTERATTAC

...us Fighters

Farnsworth and DeVilbiss team up to fight tropical growth in warfront radio sets

Fungus growth is a swift destroyer of vital fighting equipment in tropical areas. Because it can put radio sets out of order in six hours and cause a serious emergency, this condition demanded swift action.

The Farnsworth Television & Radio Corporation, supplier of radios for jeeps, tanks and scout cars, found a fungicide coating material that would check the scourge. But because it was very poisonous and yet had to be applied to the intricate recesses of a radio set, it presented a real problem. So they sent for the DeVilbiss engineers.

These DeVilbiss engineers went into action quickly. Standard Spray Equipment was supplied and special downdraft exhaust tables were designed and installed. Now, intricate small parts and sub-assemblies are rapidly and thoroughly coated with fungicide—without endangering the health of spray operators. And the life of radio sets has jumped tenfold.

This teamwork of Farnsworth and DeVilbiss and the fast action in meeting this urgent and unusual demand shows DeVilbiss' capacity for meeting and solving unusual and urgent problems . . . something worth remembering when conversion problems face you.

THE DEVILBISS COMPANY · TOLEDO 1, OHIO

Canadian Plant: WINDSOR, ONTARIO

DE VILBISS

Spray Systems

INTRODUCING

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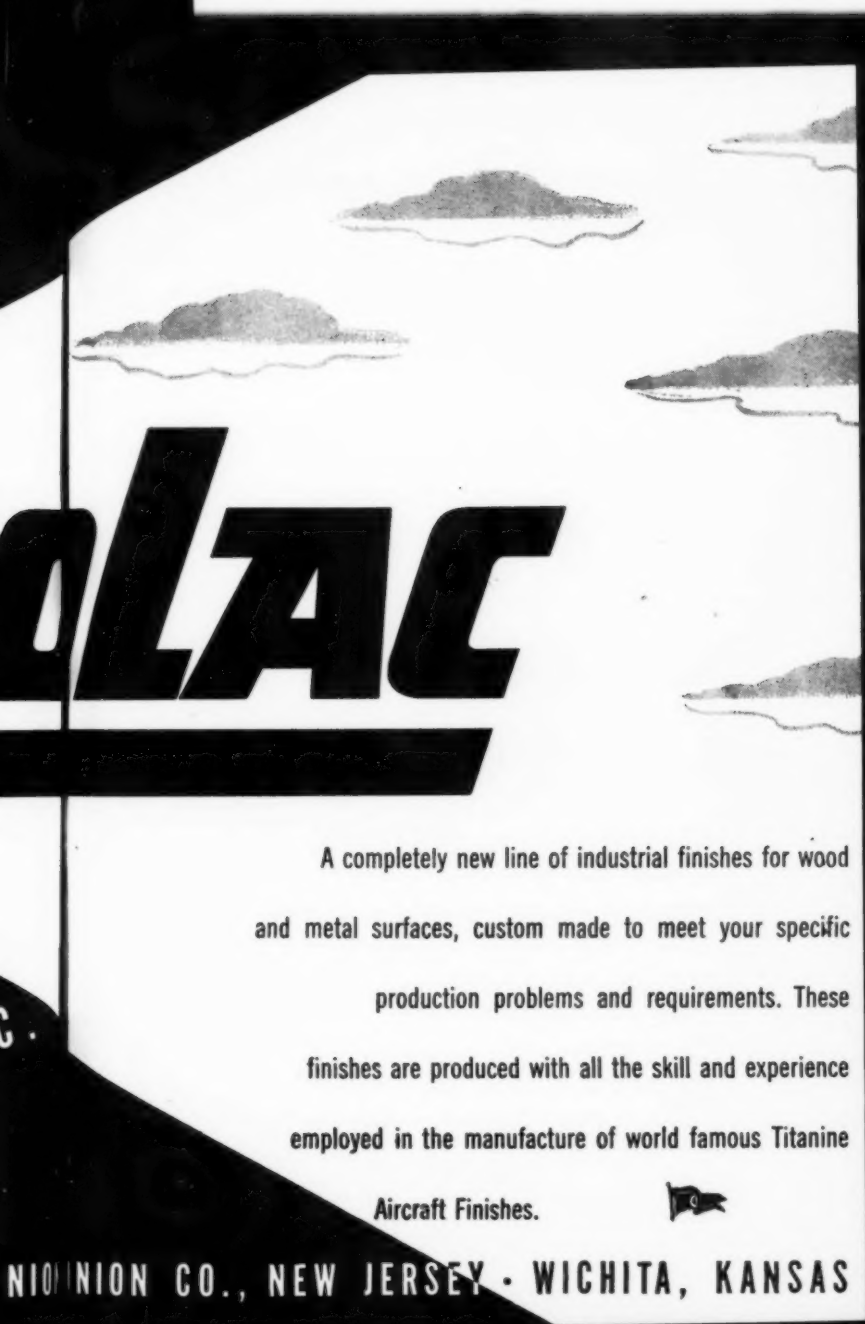
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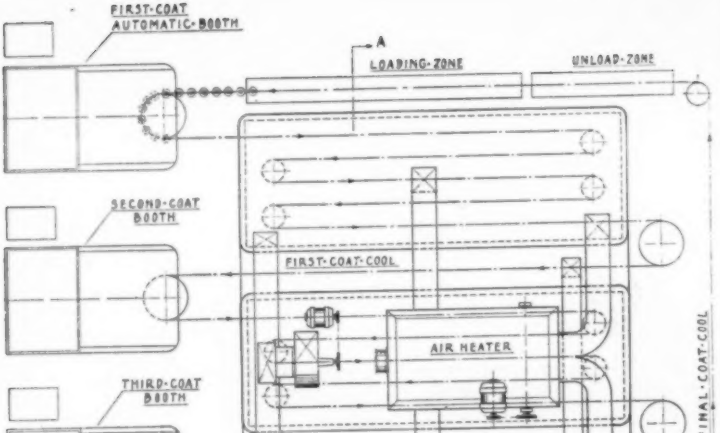
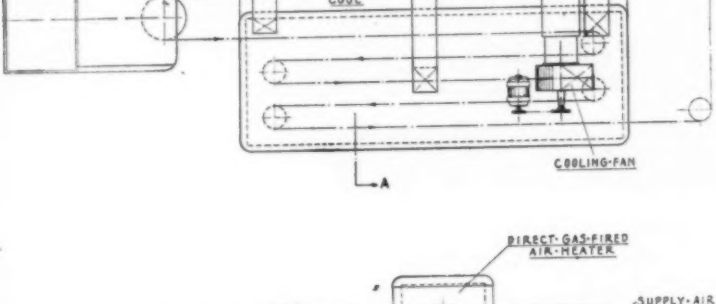




SECTION A-A

Here are plan and cross-sectional views of a complete conveyorized setup for automatically spraying, baking and cooling a 3-coat job on odd-shaped items.

3-Coat Finishing Setup

BY A. G. TRIVISON

Project Engineer for the Industrial Oven Engineering Co.

What factors influenced us to plan a conveyorized automatic spray-painting bake-oven set-up the way we did, how it works now and how simple it will be to change over to take another product when our customer is ready for postwar reconversion.

VERY often, in the design or manufacture of a product, the plant or equipment engineer is faced with a problem of handling and finishing odd-shaped pieces or parts. Sometimes these pieces are easily handled by an overhead monorail or crossbar conveyor for either dip-coating or spray-coating. However, these pieces may require such a critical finish that dipping is not feasible on account of tears or runs; or the pieces may be of such design that no provision can be made for suitably handling them. Such is often the case in aircraft engine accessory parts, deep-drawn light-metal sheets, ignition manifolds, or long cylinder-shaped parts for any use.

In one particular case a condition arose wherein three distinct sets of parts were to be finished through two primer coats and one finish coat. In addition, each part had peculiarities of its own which definitely influenced the design of special equipment for painting, baking and cooling the parts.

Odd-Shaped Parts That Customer Had to Paint

In the overall part range, the parts were generally as follows: Part No. 1 consisted essentially of a 1½-in. diameter aluminum thin-walled tube, approximately 40-in. long, open at one end and closed at the other. Throughout the length of the tube there were punched holes equally spaced and approximately ¼-in. in diameter.

Part No. 2 likewise was a thin-walled aluminum tube approximately 1½-in. in diameter at the base by 38-in. long, tapering uniformly to a ¾-in. diameter tube at the top. At regular intervals through the length of the tube, ½-in. pipe-threaded connections were welded at approximately a 45° angle to the vertical axis of the tube. These six or eight threaded connections emanated from the tube at different radial angles from the tube's vertical axis. The threaded fittings were not to be painted. Likewise, at the large diameter end of the tube, a union connection was provided for fastening this tube in place in the final machine assembly. This union also could not be painted.

Tube No. 3 was similar to Tube No. 2, except that at the very base of the tube a gooseneck union fitting was required, with the plane of the union face at a 45° angle from the axis of the tube. The total amount of offset at the gooseneck was approximately 2-in. At a point three-quarters up the height of this tube, a non-painted band was required. *(Turn to page 34)*

Large Volume Output Justified Full Automatic Setup

In the overall picture, a large number of tubes of each type were to be made, so a high-production system was required in a small amount of floor space. The very nature of the work—that is the relatively large number of parts to be painted, as well as the precise finish that the specifications demanded—immediately ruled out continuous dipping and draining, regardless of the electrostatic detearing equipment available. Then too, there were no provisions in any one tube for suitable hanging holes or hooks. The economies of attendant labor cost did not permit separate oven and conveying systems nor manual attendance at the required number of spray booths. High production rates and time studies would indicate a total of six spray booth operators.

This briefly describes the basic consideration behind the problem. In general terms of process and production it can be summed up as follows:

1) Three styles of thin-walled tubes approximately 1½-in. in diameter by 38-in. long, with a variety of unpainted surfaces.

2) High production rates on each tube per hour.

3) Triple-coated and cooled, painted finishes to specification.

4) Low unit finishing costs in terms of labor charges.

5) Reasonable low primary cost.

6) Adaptable to future work in wide range of parts.

Three Coats; Three Ovens; Three Cooling Zones

After giving the problem the usual amount of engineering consideration it was concluded that each part would be handled as an individual item and supported in such a manner that automatic spray painting could be accomplished. It was decided that each of three coats would be run through separate ovens, each with its own cooling zone, so that complete control could be had over the various baking conditions.

It was decided that the parts would be handled in vertical position on a chain-type conveyor which would be equipped with rotatable spindles on as close centers as practical.

Loading Zone Followed by Sequence of Operations

The overall design developed is indicated in the accompanying drawing. This design allows for a loading zone of sufficient length to permit parts to be put on the conveyor with minimum effort. After loading, parts are conveyed to an automatic spray booth and finishing system for the first coat. Thereupon the material moves: 1) into the first-coat oven, out of the first-coat oven through the first-coat cooling zone, 2) directly into the second-coat spray booth, into the second-coat oven, thence into the second-coat cooling zone, 3) to the third-coat spray booth, thence to the third-coat oven and thence to a final cooling zone prior to manual unloading.

Roller Chain Conveyor Operating on Its Side

After choice of the style of conveyor was made, the conveyor was designed around a roller chain operating on its side, with the axis of the roller in vertical position. Suitable guides keep the chain in line and at the same time allow the long spindles to set vertically with extreme rigidity. On the vertical spindles, which are placed on 6-in. centers, there is an additional

fixture. This fixture is arranged with a rotating device so that the parts can be rotated at the spray booths in order that all of their surfaces will be uniformly coated.

Several types of fixtures are provided for handling the various types of work, as described in the opening paragraphs of this article. The conveyor layout conforms to the general design, as indicated in the accompanying illustration.

Automatic Spray Setup Gives Complete Coverage

Inasmuch as these parts have protuberances that are angular to the length of the tube, it was necessary to plan for the spraying to be done very carefully. Accordingly it was decided that each item should be rotated on its fixture for a given length of time when it was within the path of the paint spray guns.

Due to the fact that there are protuberances which have to be sprayed from above, two spray guns are used. One gun has its axis pointing upward and another has its axis pointing downward.

As the work revolves in front of the spray booth, both guns are raised by an air cylinder to give complete travel of the spray path over the entire length of the work. Suitable cam-type interlocks prevent any operation of the guns or rotation of the vertical cylinder unless work is actually present.

As the work travels longitudinally past the spray guns the entire mounting for the guns is allowed to move along with it, so that the actual time the parts are in the paint stream is sufficient to allow for correct coating.

Each spray booth is of the water-wash type and each one is equipped with the necessary pumping, filtering and air-handling system. Spray guns, pressure tanks, paint storage and agitating facilities are included in the setup.

Three Bake-Finish Ovens Identical in Design

After leaving a spray booth the work is transported directly into a finishing oven. All three ovens are identical in design.

The conveyor track, chain, etc., and the ovens, oven floor and interior oven system are supported by suitable structural work. The ovens are so spaced that the cooling pass comes between them.

The ovens are made of regular heavy-gauge insulated panel construction designed for streamlined outside appearance, including round corners and streamlined trim on all converging plane surfaces.

Along both sides of each oven, at floor level, large volume supply ducts were furnished with their dampered outlets so arranged that the heated air is guided uniformly over the work. At the entering end of each oven, where the volatile solvents are to be removed from the paint, exhaust pickup ducts are provided. Each oven is equipped with such a duct and these ducts, in turn, are connected to a single exhaust fan system mounted on the structural platform supporting the air heater. Proper recirculation ducts are mounted beneath the oven roof and the recirculated air is taken from this point all along the length of the ovens.

Work-Holder Spindles; Heat-Loss Seals

The work is mounted on spindles that are of sufficient length to project through longitudinal slots in the floor of the oven. To prevent undue heat loss at this point, asbes-

tos seals are provided. These seals prevent the loss of heat and air but do not retard the action of the conveyor.

Each oven is equipped with a sufficient number and kind of explosion and access doors to meet all insurance requirements. The structural base, which supports all three ovens and the conveyor, is completely shrouded with a streamlined housing, generally as indicated on the cross-sectional drawing. This shroud is equipped with adjustable air inlet grilles for the admission of cooling air into the system, the air handling of which is described separately.

Air Heating Equipment; Recirculation Ducts

Inasmuch as all three ovens must operate at the same baking temperatures and times, and since the heat load is relatively small, one single heater was selected to supply heat. This heater is set up for additional air capacity, and all three ovens are directly connected by streamlined recirculation and supply ducts to this air heater. Temperatures are controlled at the outlet of the air heater and the actual temperature to each oven is further corrected by automatic dampers in the supply ducts to each oven. Temperature uniformities of plus or minus 5° are attained in each oven.

In addition, each oven is equipped with an indicating thermometer for visual inspection of its temperature. These circular-case thermometers are calibrated together to give an accurate indication of the temperature in each oven.

Specifications on the finishing required that the parts in process be brought back to room temperature before application of a succeeding coat of paint. This required forced cooling zones after the first or second coat. To accomplish this the conveyor travel and the space between the three ovens is utilized.

How the Cooling System Operates

This space is completely closed off at the end of the oven, at the oven roof, and at the oven floor, so that literally the work passes through separate enclosures. The floor on these enclosures consists of sheet-metal plates. Adjustable inlet dampers are arranged to communicate with the area beneath the oven.

The top of each cooling zone is equipped with full length suction ducts, with adjustable inlet dampers. These ducts are connected to a central cooling exhaust fan. The function of the cooling fan is to pull air from beneath the ovens through these cooling zones and over the work.

In operation, the parts are cooled to approximately 100°F., which is within the temperature requirements of the paint that is being used.

This article, so far, generally describes the overall of the equipment; no attempt is made to discuss control, construction details or other minor points.

This System Lends Itself To Easy Reconversion

This description is furnished with the abstract point of view, showing how the choice of design of equipment should be given careful consideration. This is an actual installation case and the reasons for the design determination have been explained.

In the future, when other types of parts are to be finished within the capacity of the system, it will

only be necessary to change spindles or conveyor speeds and spray-gun timing operation and setting—and the equipment will be adaptable for other uses.

In terms of plant layout, little space is occupied. This design utilizes considerably less floor area than several other types of handling equipment which were considered. In terms of plant layout, loading and unloading can be accomplished at the same end of the conveyor. In this particular case it fits into present or future production flow lines, as required of any efficient plant layout.

From the standpoint of attendant economy, one loader and one unloader operate the entire system. The automatic nature of the equipment has added somewhat to the first cost, but operating economies completely amortized the equipment cost in a very short time.

R. K. Waterman Joins M. & W.

Robert K. Waterman, sales engineer, has joined Maas & Waldstein Co., Newark, N. J. Mr. Waterman's experience in the industrial use of lacquers, synthetics and other protective coatings will be available to industries in New Jersey.

Aluminum Industries Opens Sales Office in Atlanta, Ga.

Aluminum Industries, Inc., Cincinnati, Ohio, manufacturer of Permite Products, announces the opening of a new sales office at 413 Grant Bldg., Atlanta, Ga. This office will accommodate the Southern Division Manager and territorial Representatives of the Automotive Replacement, Industrial and Paint Divisions of the company.

W. E. McDonough, Southern Division manager, will be in charge of the new office. "Walt" McDonough has been associated with Aluminum Industries for 20 years, serving his company during that period as Atlanta Representative and District Manager of the Automotive Replacement Parts Division.

Sherwin-Williams Makes Personnel Changes

The Sherwin-Williams Co., Cleveland, Ohio, announces that a change in company regulations makes the president the chief executive officer and leaves the office of Chairman of the board of directors to be filled or left vacant at the discretion of the board, Arthur W. Steudel, re-elected president, becomes the chief executive.

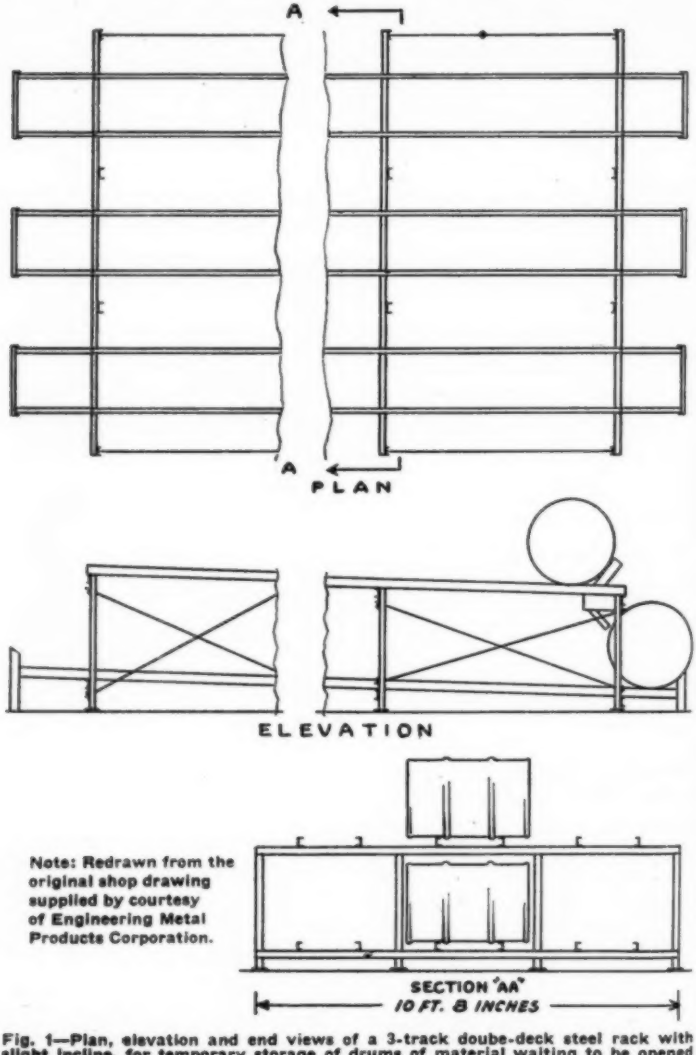
Election of Michael J. Fortier as a member of the board of directors and his appointment as vice-president in the capacity of executive assistant to

Upper left: Arthur W. Steudel, Pres.
Upper right: Michael J. Fortier, V.P.
Lower left: Milton A. Kindig, Eastern industrial sales manager.
Lower right: Gustave L. Hehl, General industrial sales manager.

the president is also announced. Mr. Fortier started with the company in 1931 as a sales representative in the New Orleans division, becoming manager in 1935. A year ago, Mr. Fortier was made vice-president and general manager of The Acme White Lead and Color Works, Detroit, a Sherwin-Williams subsidiary. Mr. Fortier will make his headquarters in Cleveland.

Gordon H. Robertson, formerly general Industrial Sales manager at Sherwin-Williams, will take Mr. Fortier's position at the Acme Co.

Also announced is the appointment of Gustave L. Hehl as general manager of industrial sales. Mr. Hehl's post as eastern industrial sales manager will be taken over by Milton A. Kindig with headquarters in Newark, New Jersey.



Note: Redrawn from the original shop drawing supplied by courtesy of Engineering Metal Products Corporation.

Fig. 1—Plan, elevation and end views of a 3-track doube-deck steel rack with slight incline, for temporary storage of drums of material waiting to be opened and dumped into mixing tanks of a paint-circulating system. This is in a plant that uses large quantities of paints for product painting.

Paint Storage, Mixing, Straining, Viscosity

Conditioning paint materials properly for cleanliness, mix, viscosity and temperature, is just as important as it is to properly prepare the surfaces that are to be painted. Here are several recommendations that will help make your use of paint materials more satisfactory and more economical.

BY GEORGE OUTCALT

IF THE PAINT STORAGE room is part of your manufacturing building, insurance regulations demand that it shall be closed off from the rest of the building by fire doors and fireproof walls. All electrical switches and motors must be of the explosion-proof type. Otherwise the paint storage shed should be a separate building away from the other plant structures. Regulations further prohibit more than one day's supply of paint of each type in the paint department.

If your paint storage room isn't heated, it is advisable to bring into the paint department the next day's requirements of paint, so the paint can gradually warm up to the working temperature. Viscosity charts showing viscosity of thinned down paint for both dipping and spraying should be prepared covering the temperature range from 50°F. to 90°F.

Storage of Paint Outside Or Inside the Building

Does it hurt paint to store it outdoors? This question has been argued back and forth. In order to get an experienced man's answer to this question, I asked the plant superintendent of a concern that manufactures industrial paints. This concern's normal inventory of finished goods for customers, awaiting releases, runs as high as 10,000 gallons. He said that the storage of paint at low temperatures does no harm. However he emphasized the importance of allowing the paint to warm up before using it. He stated further that it is conceivable that with some formulations of synthetic resin, where the polymerization of the vehicle is carried well along to the conversion point, the paint might be injured by long and protracted storage in the hot summer sun. This type of formulation, at the present time, is rare. However, to be on the safe side, it would be well to consult your paint supplier.

Store Filled Drums in Horizontal Position

Whether paint is stored indoors or outdoors, the drums should be stored lying down on the side. Perhaps this is the most violated rule of paint storage. There are three good reasons for storing drums horizontally.

First: Pigmented materials are packaged in agitator drums. The

agitator is in the end of the drum. If the drum is positioned upright, the pigment settles on the bottom of the drum. To attempt to mix the paint uniformly with the agitator calls for long and hard stirring. On the other hand, if the drum is placed on its side the pigment settles uniformly along one side of the drum. Then, when the drum is placed in position to draw off the contents and the agitator is rotated, the paint can be quickly mixed to uniform consistency.

Second: Drums placed on the side can be rolled. Rolling the drums prevents the paint from settling. Further, it makes easy the job of using the old paint first. The first lesson a clerk in a paint store learns is to put the new cans of paint on the back of the shelf and the older paint in front, so that the old stock will be sold first. Always keep the oldest paint where it can be used first.

Third: If you are using electric trucks to carry your drums to the paint room, they will be rolled onto the truck and will be horizontal anyway, so why waste your energy standing the drums upright if you are going to put them down in horizontal position later?

A Drum Storage Rack That Is Satisfactory

One large user of industrial paint materials has a special double-deck 3-track structural-steel rack for the temporary storage of drums of material in the paint mixing room. The plan, side and end views of this drum rack are shown in the accompanying drawing marked Fig. 1.

Drums of thinner are placed on the bottom tier; drums of paint are on the upper tier. Capacity of each tier is 13 drums.

Consumption is approximately one drum of each material a day.

Fig. 2—Motor, with arms attached drives agitator in drum of paint.

As the drums are taken from the lower end of the rack, the remaining drums are rolled forward to make room for paint from the receiving department. Thus, the oldest paint is always used first.

Mixing Paint Properly; Do It by Power

If you have ever turned the crank on an agitator, after about 20 revolutions in each direction your arm is tired; you hope the paint is mixed, and you proceed to draw off the contents. The man who is responsible for mixing the paint feels the same way about it. In order to be sure that paint is properly stirred, I recommend fixing up either a compressed-air motor or an explosion-proof electric motor to do the stirring. You can make or buy an attachment for the business end of the motor to fit over the square shaft of the agitator. The weight of the motor will hold it on the shaft. To prevent the motor from turning, I suggest clamping or welding arms to the motor housing, as shown in the drawing marked Fig. 2.

Another method of mixing paint in the drum (that is agitating the contents so that any separated pigment and solvent will be mixed and

with DEOXIDINE 210

to meet Ordnance Specifications

Cleaning and Conditioning Ferrous Metals with **DEOXIDINE 210** meets Army Specifications AXS-1245 Finish when used as directed in ACP Technical Data Sheets No. 3-2-210-2 and No. 3-2-210-4.

This phosphatic cleaning material quickly removes cutting oils and soil and at the same time properly conditions the surface of the many ordnance parts for paint finish. A three-stage (spray or dip) washer is all that is required to perform simultaneously both cleaning and conditioning operations. Mild steel equipment, throughout, is satisfactory—stainless steel may be used but is not required. **DEOXIDINE 210** is a superior cleaner meeting wartime requirements today, and will be equally valuable in peacetime production.

The detergent properties of **DEOXIDINE 210** are excellent and, being acidic, eliminate the danger of leaving paint removing or paint bond destroying alkali residue on the cleaned metal surface.

There are other types of DEOXIDINE suited to varying requirements in metal cleaning and for application by spray, dip or brush.

The experience of ACP Technicians is at your service to recommend the DEOXIDINE and method of application best suited to your needs.

Manufacturers of Inhibitors & Metal Working Chemicals

AMERICAN CHEMICAL PAINT CO.

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American Chemical Paint Company
Ambler, Pa.

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*Name*_____ *Title*_____

*Company*_____

*Address*_____

B-1

reunited properly) is to place the drum in a device that will whirl it by power. On some devices the drum is merely rotated on driven rollers; on others the drum is clamped firmly into position and then turned end over end for as long a time as is desired. One half hour of this agitation will generally mix any paint in a drum.

Strain Your Paint, and Control Its Viscosity

The paint maker strains paint through cloth or by centrifuge before packaging it. The paint going into the drums at the factory is clean—but the drums are not always clean, since paint drums are reused. Every manufacturer either cleans the used drums or sends them out to a company that specializes in cleaning drums. However, drums that are not properly cleaned do get into service, and thus a complaint comes in that the paint is dirty. Really it is clean paint in a dirty drum. *To avoid this trouble strain your paint.*

The No. 4 Ford cup is standard for checking a paint at spraying or dipping viscosity. For checking paint in a dip tank or mixing room, the No. 2 Zahn cup is a handier instrument. The Zahn cup is a production instrument while the Ford cup is a laboratory instrument. The Zahn cup was developed by the General Electric Co. and may be purchased from that company. It has a wire hairpin-shaped handle about 12-in. long so that the cup may be hung in a dip tank. This is very convenient for periodic checking. When you use a Zahn cup your stop watch should be started when the top of the cup breaks the surface of the liquid. The Zahn cup has an attachment for holding a dial thermometer, which permits the temperature to be read at a glance, at the same time that the viscosity reading is taken.

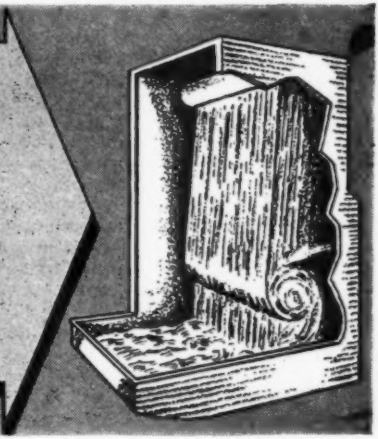
Measuring viscosity of paint with Zahn viscosity cup and stop watch.

Certain clear dipping lacquers and varnishes, as well as aircraft zinc chromate primer, are used at extremely thin viscosity. A check with either the Ford or Zahn cup is valueless, as water running through a cup has a reading of only 10 seconds. This is also true of thinner. With very thing materials the only safe way to check the viscosity, so that you can be sure you are getting a sufficiently thick film on the work, is to determine the solids in the laboratory of the thinned-down material, and then periodically take a sample from the tank and send it to the laboratory for solids determination.

When filling a pressure tank the general practice is to fill 5-gallon cans of paint in the oil house, and

PREVENT

Over-Sprayed Paint from Building Up in Your Waterwash Spray Booth



YOU CAN PREVENT over-sprayed paint, lacquer or enamel from building up on the back plates of your waterwash paint spray booth by adding to the tank of water recirculating system an economical amount of Oakite Stripper M-3 or other recommended Oakite material.

Their emulsifying and other properties condition water so that paint does not adhere to back plates. The recirculating pump and lines are kept free and clear. Paint reclamation is materially assisted. Our Technical Service Representative will be glad to make specific recommendations.

Cleaning Paint Pails

Try Oakite Stripper M-3 for removing paint from pails, stripping paint from mixers, spraying equipment, tanks. It does this work quickly, at low cost. Complete details on request. Write TODAY!

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Technical Service Representatives Located in All Principal Cities of the U. S. and Canada

OAKITE **CLEANING**

then take them to the pressure tank. In emptying these cans into the tank a considerable proportion of the material hangs to the inside of the can, especially if the paint is cold. The amount hanging to the inside may easily be more than half a gallon. Cans therefore should be scraped to remove all of the paint, if you are using a given volume of paint and thinner in your mix. A much better way is to mix paint to viscosity. The chart shown in Fig. 3 gives the viscosity over the normal temperature range.

Temperature of material being tested	Seconds to Flow from No. 2 Zahn Cup
50°F.	26.7
60°F.	24.3
70°F.	22.5
80°F.	21.2
90°F.	20.1

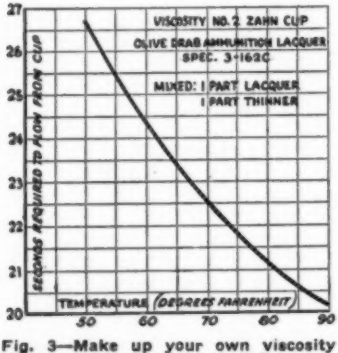


Fig. 3—Make up your own viscosity charts to show what viscosity each paint should be when used at different temperatures, say 50° to 90°F.

Proper use of a reliable viscosity cup and thermometer provides a safe method of measuring the viscosity of most liquid coating materials. The element of human error is held to a minimum. Prepare charts like the one shown in Fig. 3 for each paint you use, having previously determined the viscosity range for best spraying conditions.

Where, Unknowingly, You Lose Paint

Are you actually returning paint in drums that are supposed to be empty? A check on the weight of empty drums you are returning to the manufacturer will give you the answer. The tare weight of the drum is marked on the head of the drum. For the purpose of illustration, let us assume that this to be 60-lbs. If the drum you are returning weighs 75-lbs. then either one of two things has happened. Either your men are not tilting the drums to drain out all of the paint, or the pigment has settled to the bottom and has not been sufficiently stirred to get it in suspension. If the paint you are using weighs 10-lbs. to the gallon, then you are returning to the manufacturer 15-lbs. of paint or 1½ gallons. If the cost of the paint is $2.00 a gallon you have lost $3.00. To watch the weight of empty drums is an easy quick way to save money.

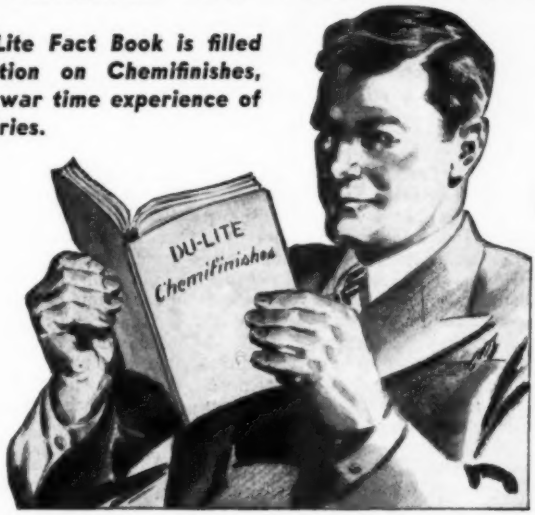
American technology is what enables industry to maintain and constantly raise its standards, to pay high wages and still produce at continually lower cost, making its goods available to everyone.

Fred A. Shephard of Lacquer Products, Inc. Passes Away

Mr. Fred A. Shephard, who for the past ten years has represented Lacquer Products, Inc., Cleveland, Ohio, in the Northern Ohio territory, passed away December 15, 1944 at Lakeside Hospital, Cleveland. Pneumonia was the immediate cause of his death. Prior to entering the service of Lacquer Products, Inc., Mr. Shephard represented the DeVilbiss Co. in Ohio and Western Pennsylvania.

MODERN FINISHES FOR YOUR PRODUCT

The new Du-Lite Fact Book is filled with information on Chemifinishes, based on the war time experience of leading industries.



Would you spend 15 Minutes to improve your Post-War Product? Then Get the Facts about DU-LITE *Chemifinishes* for Steel, Brass, Copper, Zinc

Every manufacturer of metal products faces the problem of what to do about finishes when he gets into the post-war period. Competition will be of the keenest and modern finishes will play a large part in the acceptability and attractiveness of finished metal products.

Color will mean a lot in finishes, but durability, rust resistance and cost will always be a deciding factor in the practical choice of finishes for thousands of items.

The new Du-Lite Fact Book tells you frankly and clearly what to expect of black finishes for Steel, Brass, Copper and Zinc. It is a practical handbook for the superintendent and foreman of your finishing division.

A copy will be mailed to you without charge, or to any person in your organization on request. As the edition is restricted, better write promptly.

DU-LITE CHEMICAL CORP.
MIDDLETOWN, CONNECTICUT

A Film is Born

BY PAUL O. BLACKMORE

Director, Products Engineering & Development Laboratory
Ault & Wiborg Division of the Interchemical Corporation

(Part II—Oxidation)

IN THE first part of this article (published in Nov. issue) our story centered around a fellow named Joe, a foreman finisher in a furniture factory, from whose experiences we learned something about the chemical and physical laws that govern the process of evaporation.

The scene now changes from a factory setting to that of any rural community, and we introduce you to a fellow named George.

George is a house painter and a good one, too. There are thousands of Georges in these United States who wield their brushes skillfully, who blend their paints with integrity, and who do a fine job in helping to maintain the slogan, "Paint Protects America."

If you ask George what makes his house paint dry, he will reply, "It oxidizes," but if you press the question and ask him what he means by that, George will probably become vague and evasive and may end up by telling you to consult a paint chemist for the answer.

If you follow his advice, you may find that the chemist is a bit evasive himself, for although he has spent considerable time on a study of the drying of oils, the answers are not as clearly in evidence as he wishes they might be. However, certain observations have been made and we will attempt to acquaint you with them in the following paragraphs.

One day, during the process of mixing some paint for a job, George spilled a little linseed oil on the floor. Since it was in an out-of-the-way place, George didn't wipe it up just then, and forgot to later. When George noticed the little pool of oil several days later, he observed that a skin had formed over the surface. Subsequent examinations showed that this skin became thicker and tougher and finally the pool of oil had become a solid gel. If you told George that he had made some "linoxyn," it is doubtful that he would be seriously impressed, but nevertheless that is the name given to the solid rubbery product resulting from the oxidation of linseed oil.

Here is Nature at work again, putting the finishing touches to George's skillful handiwork by converting the wet paint, which he had

Second installment of a 3-part article wherein the author explains, in non-technical language, something that every one of us should know about paints, lacquers and varnishes, namely, what makes the spread-on films dry. Drying by evaporation was explained in the first article; drying by oxidation is taken up in this article; next will come drying by polymerization.

● Old Man Corrosion is always a threat, and never more so than during these winter months. So now is a good time to give every surface protection against the forces of wear and decay.

While restrictions on the sale of aluminum paints have been relaxed, certain materials required in producing Permite Aluminum Paints for product finishing are still scarce. So product finishing aluminum can be supplied only on orders of high priority rating.

The experience of Permite chemists and the facilities of Permite's modernly equipped paint plant are also at your service in providing synthetic enamels, varnishes, lacquer enamels – and other product finishes formulated to government specifications.

Quotations on your requirements submitted promptly upon request.

ALUMINUM INDUSTRIES, Inc., Cincinnati 25, Ohio

The Permite Line of Industrial Finishes includes Synthetic Enamels, Lacquers, Lacquer Enamels, Varnishes – also Government Specification Finishes.

PERMITE READY MIXED ALUMINUM PAINTS

applied, to a dry protective film of enduring beauty. How did Nature give birth to *this* film?

We will try to tell you, but first let us see what Nature had to work with. We are talking about linseed oil for the sake of simplicity, but as we have indicated above, it is none too simple.

The Composition of Linseed Oil

Linseed oil is obtained from flaxseed and is extracted therefrom by means of pressure or volatile solvents. The literature tells us that the extracted oil is a mixture of the "glycerides" of several fatty acids. A "glyceride" is the product of reaction between glycerine and a fatty acid. Conversely, when an oil is treated with sodium or potassium hydroxide, saponification takes place and glycerine is split off, leaving the sodium or potassium salt of the various fatty acids behind.

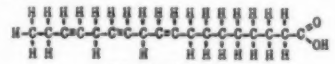
Technologists are generally agreed that linseed oil is composed of linoleic, linolenic, oleic, and other saturated acids plus glycerine, but there is considerable difference of opinion as to the percentage of each present. As a matter of fact, the percentages are known to vary widely in oils from various sources, and in oils from the same source from one year to the next. However, according to Friend,[1] the composition of linseed oil will vary between the limits given in Table I, depending on the "iodine number."

Iodine Number	180	170
Saturated acids	10.0%	10.0%
Linoleic acid	48.3%	59.1%
Oleic	5.0%	5.0%
Linolenic acids	32.1%	21.3%
Glyceryl radicle (C_3H_5)	4.6%	4.6%

Table I—Composition of linseed oil varies according to its iodine number.

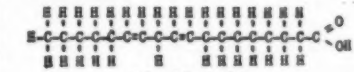
[1]Chemistry of Linseed Oil (D. Van Nostrand).

The "iodine number" of an oil is a measure of the ability of that oil to absorb oxygen, and, therefore, reflects its drying capacity. Both iodine and oxygen react similarly with the oil molecule, but since iodine lends itself more readily to quantitative measurement, it gives us a fairly simple and accurate means of determining the drying ability of the oil. Thus, the higher the iodine number, the better the drying. It will be noted from the above table that the oil with the higher iodine number contains more linolenic and less linoleic acid than the oil with the lower iodine number. Thus, it would appear that the linolenic portion contributes the most in the way of drying. An artist's portrait of a linolenic acid molecule would look something like the following:



Linolenic Acid

Do you see what we mean when we say that oil chemistry is not too simple? Here is a similar picture of the other major component, linoleic acid:



Linoleic Acid

An examination of these portraits reveals the following information:

1) Both molecules contain 18 carbon (C) atoms.

2) The first carbon atom in each molecule is attached to three hydrogen (H) atoms. This constitutes what is known as a "methyl group."

3) The last carbon atom in each molecule is attached to an oxygen (O) atom and a hydroxyl (OH) group. This constitutes what is

What a pleasant surprise they got!

Back in '40-'41, when Steinway answered the call by diverting its skill to the making of gliders, they had thousands of piano parts, consisting of rims, legs, tops, etc. in various stages of finish with Murphy coating. All went into storage.

Upon limited resumption of piano production recently, Steinway was agreeably surprised to find that all of these parts were in perfect condition for continuance of final coating. Such almost unbelievable resistance to shrinkage on a wood surface in storage was only possible with a modern plastic finish.

Murphy is grateful for the opportunity of sharing in the contribution Steinway quality has made to our gliders and service pianos in all theaters of operation.

Enduring quality has been an outstanding characteristic of Murphy Finishes since 1865. It results from "know how" backed by intensive research—and a policy of formulating *individualized finishes* that are especially designed to meet a given product's finishing requirements.

Since Pearl Harbor, Murphy has produced over 1700 finishes for both war and essential civilian needs.

Put it up to Murphy

Why not put your war or postwar finishing problems up to the Murphy Service Salesman?

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known as a "carboxyl group" and is the portion of the molecule that gives the substance the right to be called an acid.

4) In the case of linolenic acid, all but six of the remaining carbon atoms are attached to two hydrogen atoms as well as to the adjacent carbon atoms.

5) In the case of linoleic acid, all but four of the remaining carbon atoms are attached to two hydrogen atoms as well as to the adjacent carbon atoms.

6) Where a carbon atom is attached to only one hydrogen atom, that carbon atom is doubly bonded to an adjacent carbon atom.

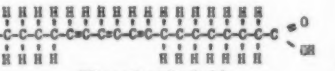
The group is known as an "ethylenic linkage" and the molecule is said to be "unsaturated" at that point, meaning that it still has the capacity to take on additional hydrogen, oxygen, iodine, etc.

What Contributes to Faster Drying of Paint

If the reactions, such as oxidation, take place at the ethylenic linkages or "unsaturated double bonds," it stands to reason that the more of them in the molecule, the faster will be the drying of that particular molecule, and here we have the answer to why linolenic acid contributes more to the drying of linseed oil than does its co-partner, linoleic, for we can see from the foregoing chemical portraits that linolenic acid has three such double bonds whereas linoleic has only two. Oleic acid, a third component, has only one double bond and its drying properties are practically nil.

In addition to the importance of the *number* of ethylenic linkages or double bonds in the molecule, their *position* also greatly influences the drying behavior of the oil. Referring again to our portraits of linoleic and linolenic acids, it will be seen that each ethylenic linkage is separated from the other by at least one group.

Now let us meet another member in the family of drying oil fatty acids. This member's name is Elaeostearic Acid, and is the principal fatty acid constituent of China Wood Oil. Here he is.



Elaeostearic Acid

Notice how he maintains his true family traits: 1) A methyl group at one end; 2) a carboxyl group at the other; 3) 18 carbons in all. But there is this difference. The three ethylenic linkages are side by side, rather than being separated by a group.

In the case of linoleic and linolenic acids, the double bonds are said to be "isolated," while in the case of elaeostearic acid they are said to be "conjugated." Conjugated double bonds make the molecule very much more reactive. Elaeostearic acid has the same number of double bonds as does linolenic, but because they are side by side in the molecule, China Wood Oil becomes a very unruly and cantankerous child.

It took varnish makers and chemists a long while to learn how to control China Wood Oil reactions, and many of them learned the hard way, and only after many bitter experiences in digging a "gunked" batch of wood oil out of the kettle. This same high reactivity makes China Wood Oil unsuitable for use as a major constituent of house paint because its affinity for oxygen causes it liter-

(Continued on page 54)

RUFKAST Goes to War on Instrument Panels

. . . Non-Glaring
. . . Large, Medium and Fine Wrinkle

Speed up war production with this new, improved Berry Brothers' Rufkast. Quick baking means more production. Strong wrinkling action protects it against shiners—results in fewer rejects. Nonglaring surface cuts down eye strain—makes the fine-pattern-dull an ideal finish for instrument panels.

Use Berry Brothers' Rufkast as a time-saving finish on radio and radar equipment.

All three patterns—large, medium and fine—can be baked with infra red equipment, as well as in gas or electric ovens. All wrinkle properly, even under high initial heat. Edges and corners wrinkle uniformly, and hardening of film continues after baking, due to oxidation of drying oil.

Infra red baking time depends upon weight of metal, but 10 minutes with 250 watt lamps is usually sufficient. Gas or electric oven baking is one hour at 250-275°.

Available on low priority. Write for further information.

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Paint circulating tanks with Binks combination agitator and circulating pumps, modulating valves, and inter-tank connections . . . at Jacksonville Naval Air Station, Yukon, Fla.

Sure! Our Navy is the best in the world . . . but, do we know that it's perfection in small details that adds up to strength and greatness? Perfection, for example, in things like paint spraying . . . with the most modern equipment that engineering skill has yet devised.

Consider for a moment the paint spraying equipment shown here in random views from the U. S. Naval Air Station at Yukon, Florida . . . especially designed and built by Binks. It features a Binks paint circulating system providing maximum uniformity of finish, production speed, and economy.

Because uniform viscosity, color, and pressure are assured, less supervision is required. With paint automatically piped to the booths, handling and cleaning labor are greatly reduced . . . and space is saved.

You'll want modern efficient equipment like this to meet the demands of the highly competitive markets of the postwar future . . . and you'll gain precious time if you let Binks engineers begin now to prepare designs for equipment which will meet your own particular needs.

Without obligation, talk it over with the Binks man located near you. See list below, and start things moving with a letter now.

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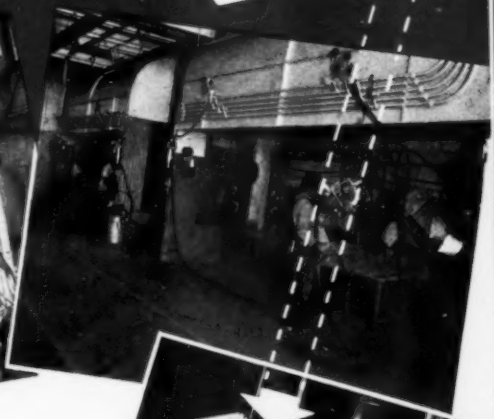
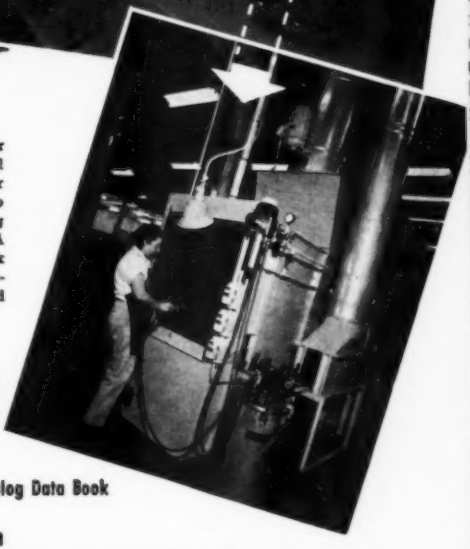
THE PAINT GOES
'ROUND AND 'ROUND
AND COMES OUT
HERE . . . AND HERE AND HERE





Above, left: Binks 12-foot Dynaprecipitor water wash spray both for painting small airplane parts at the Jacksonville Naval Air Station. Above, right: Over-all view of two Binks spray booths, showing the circulating lines, one for each color. Lower, right: A Binks spray booth used for painting spark plugs. Use of a separate pressure tank provides an extra color. Continuous carrier and drying equipment are also shown.

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ally to burn itself up in a short time, resulting in premature failure by cracking and checking.

Understanding the Chemist's Language as Pictured Here

And now to make the confusion quite complete, let us see by what other names the chemist knows our fatty acid friends.

Cis—9:10—cis—12:13 octadecadienoic acid.

Roll that one around on your tongue for a moment, and if, when you've finished, you can still say linoleic acid, perhaps it would be better to do so. However, to the chemist, this tongue-twister describes his molecule.

The two "cis" syllables tell him that in both ethylenic linkages, the hydrogen atom is on the same side of the carbon atom, thus If he had said "—cis—trans" it would have indicated hydrogen atoms on opposite sides of the carbon, thus .

The 9:10 and 12:13 tell him the position of the double bonds in the molecule. Count them for yourself. Turn back to our portrait of linoleic acid and count the carbon atoms backwards from the right end ( ) to the left ( ). Surely enough; it comes out that way.

The first double bond you come to is between carbon atoms 9 and 10, and the second is between 12 and 13. Notice that we skip carbon atom 11, so these double bonds are isolated.

The "octadeca" part, of course, means 18, the total length of the carbon chain. "Di" means 2, and "enoic" is short for ethylenic.

Using this technique, let us see if we can name linolenic acid. Look at its portrait again. We see that: 1) The hydrogen atoms in the ethylenic linkages are all on the same side of the carbon, or in the "—cis" position.

2) Counting again from right to left, the first double bond is between carbon atoms 9 and 10, the second is between carbon atoms 12 and 13, and—oh, yes—don't forget we now have a third, and it comes between carbon atoms 15 and 16. What is the symbol for three? You guessed it; "tri."

"Going shopping, Miss White?"

"No, Mrs. Black, I'm really looking for Ethelene. Our Scotty dog Ethelene got in the habit of going over to Minsky's Market whenever she could get away, and we haven't seen her for two days now."

3) We again have 18 carbon atoms, so our "octadeca" stays with us. The name?—cis 9:10—cis 12:13—cis 15:16 Octadeca-TRIenoic acid. Here we have skipped carbon atoms 11 and 14, so again we have "isolated" double bonds.

Simple, isn't it? And by the same reasoning, elaeostearic *has* to be 9:10, 11:12, 13:14 octadecatrienoic acid. Note that in this case

Show me the way to get home

Rely on Reliance

★

One of the best New Year's resolutions we know of would be to resolve to return — at once — all empty drums to your suppliers! The need for drums is urgent with all of us and will continue until war's end! Won't you take inventory and "show 'em the way to get home?"

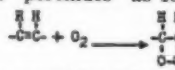
Contributed in the interest of the industry and the war effort by RELIANCE VARNISH CO., INC., LOUISVILLE, KY.—CHICAGO, ILL.

we have skipped *no* carbon atoms between 9 and 14, which tells us that in this molecule the double bonds are "conjugated."

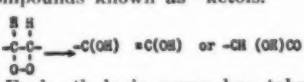
Having now been properly introduced to our oil molecules, let us see how Nature makes them behave.

Two Stages in Drying of Linseed Oil Paint

As to the actual drying mechanism, most authorities agree that there are two stages in the drying of linseed oil. The first, known as the "induction period," takes place within the first two or three days, followed by the second which may require 20 to 30 days to reach anything approaching completion. It is thought that during the induction period, oxygen enters the molecule at the ethylenic linkages to form "peroxides" as follows:



These peroxides later undergo a molecular re-arrangement to form compounds known as "ketols."



Each ethylenic group has taken up two atoms of oxygen. In a trienoic acid such as linolenic, it is possible, therefore, for the molecule to absorb six atoms of oxygen.

Chemists have assigned certain numbers to each of the elements which express their relative weights. The atomic weight of hydrogen is given as one, carbon is 12, and oxygen is 16. Counting the atoms in our linolenic molecule, we have:

18 Carbon	times	12	equals 216
30 Hydrogen	times	1	equals 30
2 Oxygen	times	16	equals 32

Adding these, we arrive at a molecular weight of 278 for the

linolenic acid. If this molecule takes up 6 oxygen atoms, it should gain 6x16 or 96 units in molecular weight, or approximately 34.5%.

Linseed Oil Film Gains in Weight as it Dries

Therefore, a linseed oil film should and does gain in weight on drying, but, I assure you, nothing like 34.5%. In the first place, less than one-third of it is linolenic acid, and the linoleic and oleic portions are capable of absorbing not six, but only four and two molecules of oxygen respectively. Secondly, as the initially formed peroxides break down, the reaction results in the liberation of carbon dioxide, acetic acid, ketones, and aldehydes, all of which are volatile and leave the film. Thus, the film is losing weight at the same time it is gaining it.

Most of the weight increase takes place within the first eight or ten days of the drying period and may amount to a net gain of 18% to 20%. The film then begins to lose weight because oxygen is being absorbed more slowly than the volatile oxidation products are given off. After three months, the

(Continued on page 60)

PLANNED INSTALLATIONS LIKE THIS MAKE FASTER, FINER FINISHING A CERTAINTY

Completely Coordinated FINISHING SYSTEMS Engineered to Your Plant and Product

Here is a typical example of what proper planning can accomplish in coordinating the various processes of Finishing into a compact, smoothly-operating system that conserves both time and man-power—and does a better job. This installation was specifically designed to handle the complete finishing of aircraft engine parts. But—whatever the product to be processed—regardless of nature, size or shape—Mahon engineers can be of material assistance in planning and producing the precise equipment you may need to put YOUR production on a fast-moving, highly efficient and economical basis.

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for Thin Shells

"Second Wind" for Fighter Planes

Tear-shaped jettison fuel tanks formed of thin steel shells are used by fighter planes to supplement their normal fuel supply. Fighters are thus enabled to increase their flying range and extend protection to the bombers they escort.

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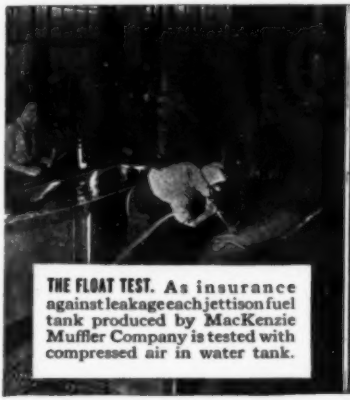


THE FLOAT TEST. As insurance against leakage each jettison fuel tank produced by MacKenzie Muffler Company is tested with compressed air in water tank.

PAINT FOR PROTECTION! After testing, final protective coat of Sherwin-Williams finish is sprayed on every tank in special painting and drying racks.

MacKenzie Jettison Fuel Tanks protected by SHERWIN-WILLIAMS Finishes!

When the MacKenzie Muffler Company — world's largest manufacturer of jettison fuel tanks—began production, they had to be sure these delicate, lightweight steel shells would withstand handling and exposure to the elements.

To give these tanks the necessary "tough hides" of protection against external corrosion and abrasion, four Sherwin-Williams products are used: Zinc Chromate Primer, Camouflage Gray No. 43, Opex Clear Lacquer and Opex Navy Gray Lacquer. The resultant hard, firm, even finish resists deterioration... conforms to Navy camouflage specifications...and further reduces the low wind resistance effected by the tanks' stream-lined design.

Sherwin-Williams materials, experience and technical knowledge are also available to *you*, on both present and post-war production. Write The Sherman-Williams Co., Cleveland 1, Ohio.

INDUSTRIAL FINISHES

film may have retained a net gain of only 10%. While all of this was going on, the film was gaining in density. It also gained in volume for a while, but having reached the solid linoxyn stage, it began to shrink and probably ended up several percent smaller in volume than when freshly applied. The extent of this volume change is extremely important because of its bearing on the ultimate durability of the film. Failures by cracking and checking may often be attributed to unusual volume changes (and the stresses and strains attendant thereto) occurring during the drying of a film.

Several Factors Govern Rate of Oxidation

The rate of oxidation is governed by a number of factors.

1) Driers or catalysts speed it up tremendously. Numerous theories have been advanced to explain the action of driers. It is all very complicated and not within the scope of this discussion. It will suffice to say that it is believed that the drier metals carry oxygen into the molecule by entering it themselves during the formation of an intermediate compound which further reacts with the ultimate re-liberation of the metal, which is then available to re-enact the cycle.

That driers *do* speed up the oxidation of oils is forcefully shown in the following data presented by Ingalls[2] on linseed oil films of .001 to .003-in. thickness containing 2% of the resinates of various metals.

Where driers are used, the induction period during which peroxides are formed is eliminated or materially reduced. Auto-oxidation gives way to catalytic oxidation which is very much faster. Here is a way in which George can help Nature perform her task, and I'm sure you will always find a can of drier among his bag of tricks.

Material	Drying Time (Hours)	Increase in Wt. at 12 Hrs.
Linseed Oil alone	121	.93
Manganese	12	17.4
Lead	26	9.4
Zinc	30	6.5
Calcium	32	6.0
Copper	46	4.9
Iron	60	4.1
Aluminum	85	2.8
Chromium	95	2.0

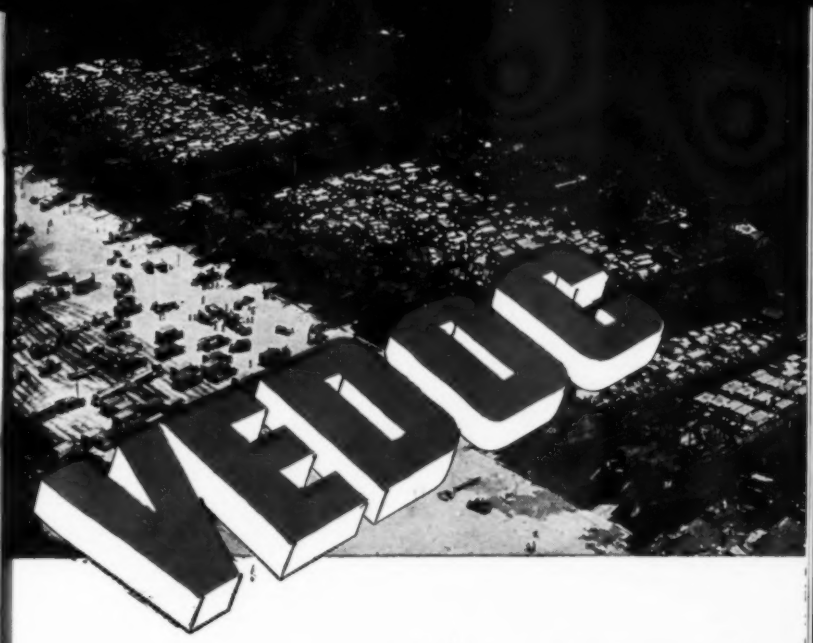
2) Temperature affects the rate of oxidation. It has been shown that for every 10° rise in temperature, the setting time of linseed oil is cut in half. That is what makes George's work seasonal. He cannot do much about controlling the weather, but he can and does select a propitious time to do his exterior painting.

Light Accelerates Drying

3) Light appears to have an accelerating effect on the oxidation of the film. Genthe, a German investigator, has shown that a linseed oil film that showed a gain in weight of 22.6% under ordinary conditions, showed a gain of 25.8% when dried under the rays of a mercury vapor lamp. George cannot irradiate the house he is painting, but Nature can and does with good old summer sunshine.

4) Genthe also showed that a linseed oil film dried in air at 95°F. gained in weight 26.8%, while at the same temperature in an atmosphere of oxygen the gain was 34.7%. Thus, availability of oxygen is a governing factor. George can do nothing to aid Nature in this respect in so far as his exterior work is concerned. When painting indoors, however, he can see that adequate circulating fresh air is provided to supply

[2] Chemical Trade Journal 17/4/20



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the film with oxygen and to carry away the volatile oxidation products. This aid to Nature must be tempered with judgment. It would not do, for example, to throw open all the windows in the middle of winter, because he would lose more drying by lowering the temperature than he would gain by making available more oxygen.

5) Moisture both helps and hinders. It has been shown that moisture accelerates the decomposition of the peroxides and increases the rate of weight gain, thus materially shortening the induction period. However, hard drying of the film is retarded by moisture. Since the induction period is eliminated anyway by the use of driers, dry air is preferable. Since Nature is called upon to do other tasks in addition to drying paint films, such as watching over the growth of plants and animals, she may elect to provide moisture very much to the detriment of George's paint film. If she does, George must take it good naturedly, realizing that he does not have a priority on Nature's facilities, and that she will take care of him in her own good time.

Film Thickness of Paint

6) Film thickness is very important. Just as Joe complicated Nature's task when he gave his end table an extra pass with his spray gun, so will George do likewise if he applies his paint too heavily. In Joe's case, Nature had to eliminate a third more solvent molecules from a given area. In George's case she will have to bring to and cause to combine with the film proportionally more atoms of oxygen per given area.

If, in her zeal to do a job for George, she delivers to the spot a large amount of air, light, and heat, George may come back some day to find his paint film all wrinkled and unsightly.

7) Last, but not least, we must mention the character of the surface upon which George applies his paint. If it is new, unpainted wood, George will find that it has a ravenous appetite for the oil in his paint. Its absorptive power would make a self-respecting blotter turn green with envy. As the maze of intricate passageways and cells fill up with the precious oil, naturally there is less of it remaining on the surface to undergo oxidation. Furthermore, the resulting increase in the pigment volume ratio aids in the apparent dryness of the film.

George may elect to add a little additional oil to his first coat to overcome the demands made upon it by the oil-thirsty wood.

And so another film is born. If its parentage was of good, unadulterated linseed oil stock, if it was judiciously pigmented, if it was not overloaded with driers to burn it up, if it was carefully applied on a clean, dry surface, Nature will nurture it to a healthy child and it should live to a ripe old age.

Next month we will bring you a new character and a new problem. We'll call him Bill, and his problem is "polymerization."

(To be continued)

United Lacquer Moves Its New England Plant

The United Lacquer Mfg. Corp., Linden, N. J., announces the new location of its New England Mfg. Division, as being at 127 Spring St., Everett, Mass. The new plant has much larger floor space, which will provide adequate room for greatly expanded operations. A complete line of lacquers, metallized finishes, synthetics and special coatings, including the company's well-known leather finishes, will be manufactured at the new Everett, Mass., plant.

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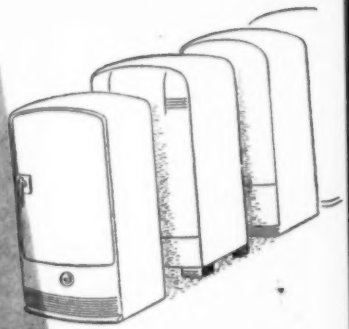
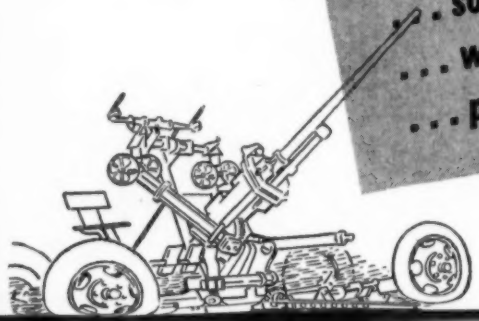


TOMORROW



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REG. U.S. PAT. OFF.

In this final installment of a 2-part article, Mr. Wray takes up primers and various types of protective and decorative coatings that are especially suited to different aluminum products . . . some coated before, others after fabrication.

Finishing Aluminum with Paint Coatings

AS IN THE case of other metals, there are several different primers which may be used on aluminum. Which one to use depends largely upon the specific application. The purpose of the primer is to serve as a bonding coat between the metal surface and the finish. The primer must therefore show good adhesion to the metal surface and at the same time permit good adhesion of finishing coats to itself. Under some conditions the primer must also possess definite corrosion inhibiting properties and show good resistance to moisture penetration.

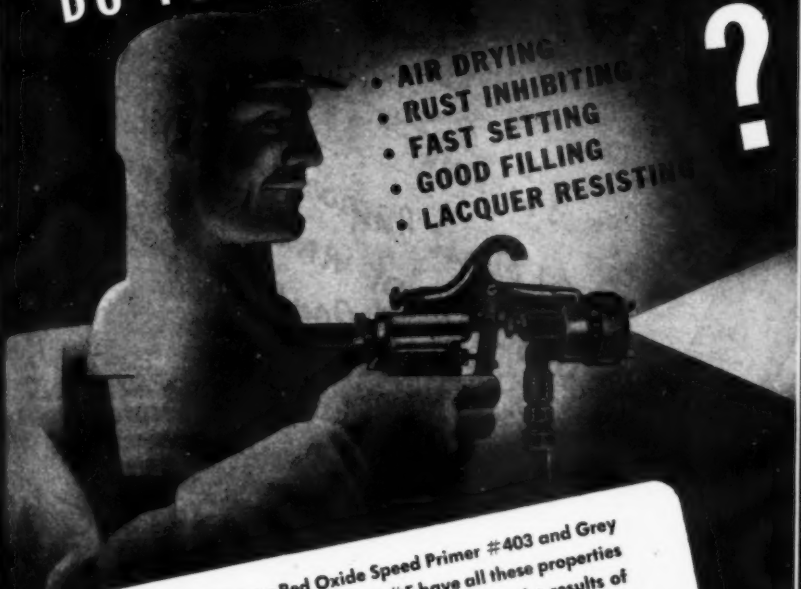
In the metal decorating field the primer, or size coat as it is sometimes called, may be a clear or lightly pigmented coating. In addition to having good adhesion to the metal, for this application, the primer must also be quite flexible and must be capable of withstanding severe forming operations as, for example, in the manufacture of aluminum seals. Special formulations of Vinylite-resin coatings, alkyd oil modified coatings and phenolic-resin coatings are especially applicable for this purpose. They are baked at a relatively high temperature.

Primer to Use Depends Upon Several Factors

For articles such as refrigerator parts, and similar household equipment, alkyd-base primers pigmented with white pigments such as titanium dioxide are widely used because of their good adhesion characteristics. Phenolic-base primers, on the other hand, are

BY ROBERT I. WRAY
Aluminum Research Laboratories
Aluminum Company of America

WHAT DO YOU NEED IN A PRIMER ?



M & W's new Red Oxide Speed Primer #403 and Grey Speed Primer Surfacer #5 have all these properties and more. They were developed to achieve the results of a zinc chromate primer on metal surfaces where a fast-setting, corrosion resistant, air-drying or baking primer or primer surfacer is required. In some respects, they excel zinc chromate primers, as extreme care in their application to obtain a very thin transparent coat is unnecessary.

They air-dry to recoat in 10 to 15 minutes and dry hard overnight; they can be baked in one-half to one hour at 250° F. Both materials can be coated with lacquer enamels after air-drying or baking.

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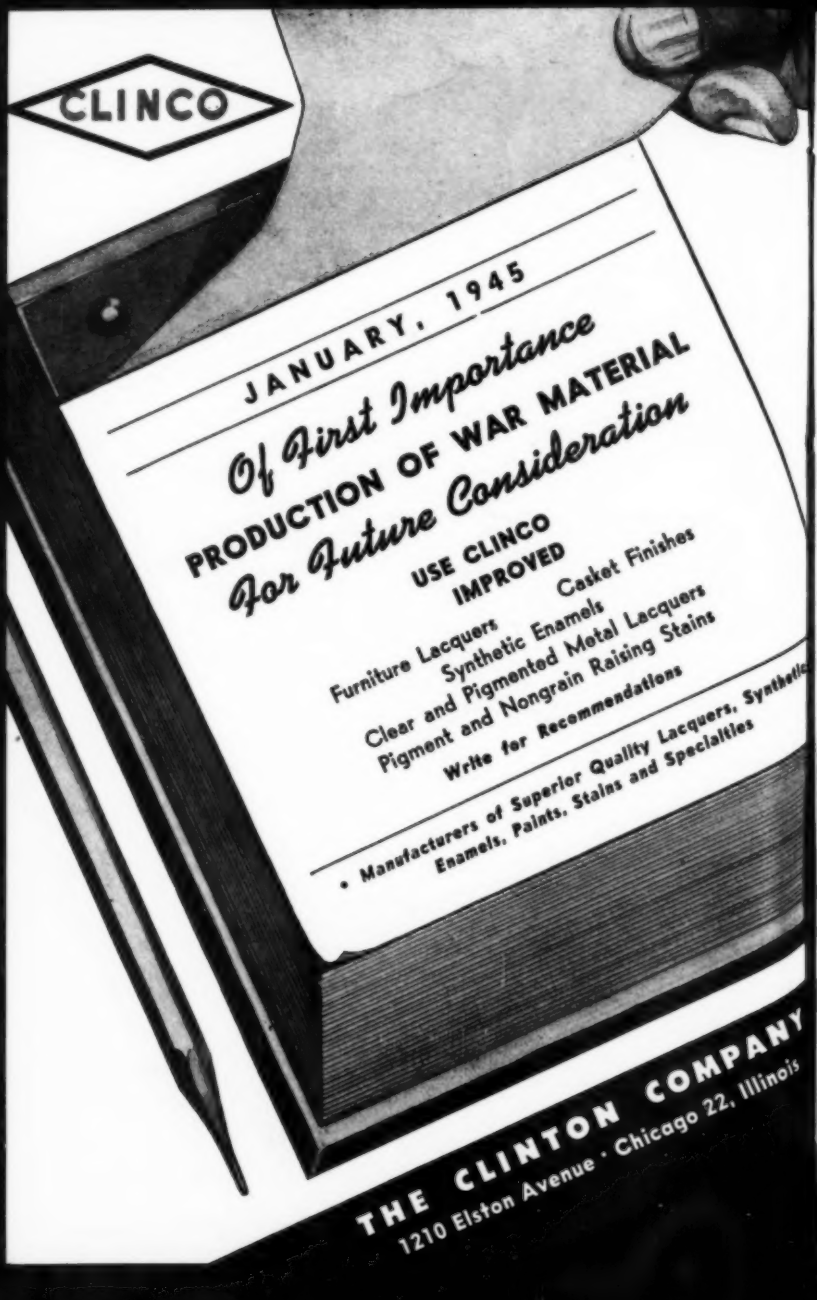
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On surfaces which will be wet frequently or may be exposed to industrial fume, a primer with corrosion inhibiting properties should be used. Zinc yellow, the trade name for zinc chromate pigment, is one of the most effective primer pigments of this type which has been tested.[5] Primers in which zinc chromate is the major pigment present are, therefore, especially recommended for use on aluminum under these conditions. Typical examples of primers of this type are those meeting the U. S. Navy Bureau of Ships Specification 52-P-18 (INT) and U. S. Army-Navy Aeronautical Specification AN-TT-P-656b. The latter primer, which is very fast drying is largely used as a priming coat on aircraft. The vehicle employed may be either alkyd or phenolic-resin base, or a mixture of the two. There are a number of commercial zinc chromate primers of this type available.

Many Different Types of Primers Available

Strontium and calcium chromates are also quite effective when used in primers for aluminum. So far, however, they have not found wide commercial use. Zinc tetroxychromate, referred to as "Z.T.O.", is also a satisfactory primer pigment. Another new type of pigment, recently introduced, which has shown considerable promise in primers for aluminum, is ammonium ferrous phosphate.[6] Combinations of this pigment with zinc chromate appear to be more effective than zinc chromate alone.

On the other hand, primers pigmented with combinations of iron oxide and zinc chromate are less effective, under severe service conditions, than those containing zinc chromate alone, especially when a high percentage of iron oxide is employed. Primers of the latter type are satisfactory for use on outside body panels of automobiles, busses, etc., however.

Another type of primer which has shown interesting results in tests is one in which the pigment consists of a mixture of zinc dust and aluminum powder. The vehicle commonly used with this primer is a treated linseed oil. There are several commercial primers of this type available. Under many service conditions, aluminum paint made with a synthetic resin vehicle, makes an excellent primer for aluminum. The use of primers containing lead pigments should be avoided on aluminum as they appear to stimulate corrosion whenever moisture penetrates the film.

Many of the primers listed above are at present unavailable for general commercial use because of wartime shortages and restrictions. The user, however, should be able to select materials that are obtainable from those described, and which will be satisfactory for specific applications.

There are a number of specific applications where special types of primers are required for some specific finishing system. For example, black baking japans, though frequently used without a primer, are sometimes applied over a special black primer designed for the purpose. This type of finish is frequently used on meter cases and like products. Chemical-resistant coatings are also usually applied over a special type of primer that is compatible with the finish coats.

Primers used under lacquer finishes must be so designed that they will not be softened and lifted by the highly volative solvents present in the lacquer. Lacquers are often used in finishing household articles.

Finishes that must be baked at a high temperature (300°F. or above) should not be used on heat-treatable alloys such as 17S or 24S when loss in corrosion resistance or mechanical properties is to be avoided. Heating at these temperatures causes a change in structure of these alloys, with an attendant loss in properties.

Surfacers and Finishes for Aluminum Products

In general finishing systems, including surfacers and enamels, which are applicable for other metal surfaces are suitable for use on aluminum. The choice of paint or enamel to be used will depend largely upon the specific service for which the article is intended. For example, alkyd enamels have been widely used for finishing the outside panels of streamlined trains. Where good abrasion resistance is required and weather resistance is not a factor, urea-formaldehyde resin enamels are frequently employed. For example, refrigerator evaporator doors made of aluminum are frequently given an Alumilite finish and the background is coated with the white urea enamel, leaving the highlights with the natural Alumilite finish. These enamels require low temperature baking (about 250°F.)

Aluminum paint is frequently used as a finishing coat on aluminum.[7] Where parts are desired with a natural aluminum color, as in the case of certain items of aluminum furniture, it has sometimes been found practical to finish with an aluminum paint coating, rather than to resort to more expensive mechanical surface finishes. The aluminum paint for this application may be made with a baking varnish or a hard quick-drying lacquer. Lacquer-type vehicles are especially suitable where the parts are handled frequently, since the aluminum pigment shows very little leafing in a vehicle of this type.

Aluminum paint, because of its high resistance to moisture penetration, is also of advantage where the surfaces are subjected to severe service conditions, as on the underframes of trains, busses, etc. Where its color is acceptable, and where a durable moisture-resistant coating is required, aluminum paint is recommended. For these applications it should be made with an exterior, water-resisting varnish.

Metal Decorating Coatings Roller Coated and Baked

There are certain applications where special coating formulations are necessary. Metal decorating coatings applied to flat sheet which is to be fabricated into bottle caps, cans, Venetian blinds, or signs, constitute one type for which special formulation is necessary. The enamel coating must be capable of machine application on a roller coating machine and, after baking, the coating must satisfactorily withstand a forming operation without cracking or loss of adhesion.

Special formulation is required for these enamels to obtain the necessary properties. Several types of available vehicles may be employed, but alkyd-resin base enamels are among those most widely used. Many suitable enamels of this type are on the market. Another application for which roller

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coating enamels are suitable, is for coating embossed numerals or letters on signs. A typical example of this use is the aluminum automobile license plates which have been in use by the State of Connecticut for about eight years. The plates are formed, then given a colorless Alumilite coating, and the numerals are painted black with a roller coating enamel. Many of these plates have been in service for eight years and are still in good condition.

Coatings for Higher Chemical Resistance

Coatings with a higher degree of chemical resistance should also be considered among the special types of coating materials. As previously indicated, a special type of Alrok coating followed by a special primer is recommended for this service. The primer is usually of the same type as the finishing coats except it may be pigmented with an iron oxide type of pigment to improve adhesion and moisture resistance of the film.

Unpigmented finishing coats appear to show better resistance to chemical attack than pigmented coatings. Frequently they are made of the same materials used for the vehicle of the primer. Heat reactive phenolic-resin coatings have been found to show about the maximum resistance to chemical attack. These coatings may be applied by spraying or dipping. The number of coats to be applied will be governed by the severity of the service conditions, although for most applications four coats (two of primer and two of finish) are sufficient.

In many cases one coat each of primer and finish will suffice. Undercoats are usually baked for short periods at temperatures ranging from 300° to 400°F., while the final coat should be baked for a longer period (usually about one hour) at about 350°F. to insure complete reaction of the resin. A variety of coatings of this type is available and the baking schedules for different materials may vary somewhat from the figures given. Coatings of this type have been widely used on aluminum parts employed in the rayon industry, such as spools and spinning buckets.

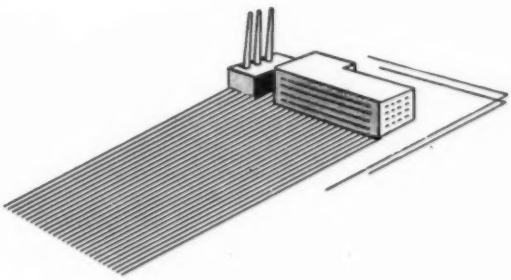
Closures made of aluminum; coating is applied to flat sheet and baked before closures are fabricated.

Other types of chemically resistant finishes include the various vinyl resins. Coatings made from polyvinyl chloride are quite resistant to attack but usually they show poor adhesion to the metal unless they completely envelop the part to be coated, as on the outside of tubing.

Painting and Maintenance of Assembled Structures

In many applications for which aluminum is used, such as in the transportation industry, assembled structures must be painted. There may be numerous joints between different parts. In many cases the joints may be formed by a strong alloy aluminum part and an adjacent steel or other dissimilar metal part. In all of these cases corro-

SMALL FRY?



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sion difficulties may be encountered under severe conditions of service, such as the underframes of railway cars and busses, unless precautions are taken to protect the surfaces of the metal in these joints. This condition is not greatly different from that encountered with most other metals.

It is good practice in these cases to prime the individual parts before assembly, using one of the primers previously described which are suitable for this purpose. Zinc chromate primers are particularly recommended. This procedure places a coat of primer on each contacting surface and in many cases this is sufficient to protect the metal in the joints.

Where conditions are unusually severe, however, additional precautions should be taken. For example when strong alloy aluminum structural parts (17S, 24S, etc.) are in contact with steel parts, electrolytic corrosion of the aluminum alloy may result, in the presence of an electrolyte such as salt water. In these cases, it is desirable to apply some type of joint-sealing compound between the contacting surfaces, in addition to the priming coat of paint, in order to prevent the access of moisture.

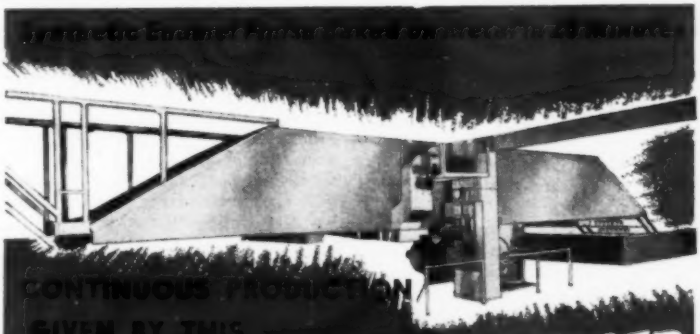
Joint Sealing Compound; Refinishing Assembled Products

One of the most effective types of joint-sealing compounds consists of a mixture of aluminum powder, inert filler, oils and thinner to form a plastic compound. The presence of the aluminum powder helps to exclude moisture and air, and it keeps the compound flexible. This compound shows good adhesion and retains an adequate degree of plasticity for an extended period. Zinc chromate is sometimes added to the compound in small amounts, as a corrosion inhibitor. Certain types of Neoprene tape have also given satisfactory service under these conditions. An important property of all joint compounds or fillers is good moisture excluding efficiency. The material should remain flexible for a long time.

In refinishing assembled structures made of aluminum, one of the first considerations is a thorough examination of the surfaces, including joints, to determine if any corrosion difficulties have been encountered. Should this be the case, the surface should be thoroughly cleaned to remove all traces of corrosion. On heavy sections this is best accomplished by means of a mild sandblast. In cases where it is impractical to use sandblasting, the surface should be cleaned by means of a rotary wire brush. After cleaning, a 5% solution of potassium dichromate should be applied and allowed to dry thoroughly. A priming coat of zinc chromate paint may then be applied followed by the required finishing system.

Clear Finishes Desirable for Certain Aluminum Surfaces

For some applications clear unpigmented finishes may be desirable. For example, aluminum furniture with a natural finish requires the use of a hard, abrasion-resistant, clear coating to preserve the bright aluminum finish and prevent marring. For this purpose a coating of clear urea-formaldehyde varnish, baked on at a temperature of about 250°F. for one hour, is well adapted. This same type of finish is suggested wherever a hard clear coating is desired. Melamine resin coatings may also be used for this purpose, although they do not have quite as



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good abrasion resistance as the urea-formaldehyde coatings. The melamine coatings also require baking.

These clean baked coatings do not show particularly good durability when exposed to the weather. For applications where weather resistance is important, air-drying coatings formulated with methacrylate resins or cellulose acetate-butyrate, are generally more satisfactory. These finishes, while not as abrasion-resistant as the baked coatings, are quite resistant to sunlight. Tests indicate that two coats of these lacquers will protect aluminum surfaces for several years when exposed to the weather. This is of particular advantage for use on lighting reflectors and architectural elements.

Methacrylate lacquers are particularly well adapted for use on aluminum window sections since they will protect the aluminum from attack by alkaline mortar and concrete during erection, if the lacquers are applied before installation of the window.

The serviceability as well as the sales appeal of any painted aluminum article will depend, in large measure, upon the selection of the proper surface treatment and painting system. While it has not been possible in this article to cover all applications, it is hoped that sufficient information has been given to enable the user to select the correct procedure for any given type of work.

REFERENCES are as follows:

[5]Edwards, J. D., and R. I. Wray—"Accelerated Tests of Paint Finishes on Aluminum": Ind. Eng. Chem. (Anal. Ed.) 7, 5 (1935)

[6]Erskine, A. M., G. Grimm and S. C. Horning — "Ammonium Ferrous Phosphate"; Ind. Eng. Chem. 36, 456 (1944)

[7]"Aluminum Paint Manual"—Aluminum Co. of America (1942) Pittsburgh, Pa.

Cleans and Corrosion-proofs—Ever hear of cleaning materials by sandblast, and in the same operation applying a corrosion-proofing agent? Dry sand is delivered by air blast for the sandblasting operation. A corrosion-proofing solution can be delivered by air blast also, just as readily as an ordinary spray-painting operation can be performed. One firm has combined these actions. Dry sand and water carrying a corrosion-proofing solution are delivered by air pressure to an atomizing nozzle, which is an integral part of a special machine designed for this purpose. All three elements are delivered in regulated proportions from storage of this machine, by means of pressure connection from a shop air line.

Greasy or tarred surfaces can be cleaned faster than with sandblasters employing dry sand only, and the operation is free from dust, due to the use of the water. The machine weighs 1500-lbs. and has a hopper that holds 1000-lbs. of sand. It is not portable in the ordinary sense, but can be readily transported from one point to another by a bridge crane, being designed to make this possible.

Du Pont Opens Office in Houston

Appointment of Roy E. Troutman as manager of the new Southern District Office opened in Houston, Texas, is announced by the Pigments Department of E. I. du Pont de Nemours & Co.

The new sales office will be located in the First National Bank Bldg. at 201 Main St., Houston. Warehouse facilities will be maintained, as heretofore, at Houston and Dallas, Texas, and at New Orleans, Louisiana.

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BY S. P. WILSON, PH.D.

WITH VICTORY IN WAR now reasonably assured, interest in reconversion to civilian production becomes a major topic of both individual and Governmental planning. Avoidance of major economic dislocations will not be too easy, and fear of unemployment is widespread; therefore it is not treasonable to the fighting man overseas that producers of war goods give some time and thought to preparing for the day that will come—when the things he is planning to buy, and the job he will need to enable him to buy them, will be of first importance.

As manufacturers of war materials survey the future, the problem of finishing their postwar products inevitably comes to mind. It is something to consider carefully. They have been using millions of gallons of protective coatings for their present products, usually under specifications laid down for them, and applied under wartime conditions of inexperienced employees and abnormal pressure for output. They must now consider what to plan for, when they manufacture their anticipated products. They must consider plans from the standpoint of their own production requirements and also that of the eventual buyer.

Up to now the prime essential has been that of protection of the jeeps, the shells, the ships, and the planes from corrosion or visibility. This is one function of the finishing material industry's products. The other prime function—that of ornamentation—has been largely forgotten under the stress of war. Thinking habits of the designer and sales force must now change to keep this fact in mind.

It can be safely assumed that what will not be acceptable on postwar goods will be the flat, dull, drab olives and grays that are so useful on combat material. We can look forward then to bright colors, glossy or satin sheens, the revival of multi-tone effects, and in fact a complete reversal of present warpaint standards.

New Finishes? Perhaps, but Pre-war Finishes Were Excellent

As vehicles for this projected riot of beauty there are many possibilities. So much has been said and rumored about the new film-forming compounds that many po-

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WOOD and METAL
FINISHES

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LOOKING AHEAD

Improved methods and the latest and best in available materials will be the foundation on which to build successful reconversion plans.

Our research laboratories have been working out special formulations using the latest developments in raw materials. It is our constant purpose to maintain a complete line of finishing materials of high quality to meet the requirements imposed by modernized production methods.

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NEW PERIOD PRODUCTION FINISHES

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Established 1917

tential users of finishes are at sea as to what to plan for. They feel that immediately after reconversion starts, new and superior finishing materials will be available, and that they should mark time until the very newest product has been evaluated. On this subject I can only give my personal opinion, since many of these possibilities are still shrouded in war secrecy, and full weight of critical study cannot be given.

Before the war we had several successful and widely used classes of finishing materials. We had lacquers, oleoresinous varnishes and enamels, alkyds, urea or melamine types of baking enamels, asphaltum japans; and a small but growing group of specialized products such as cellulose ethers, modified cellulose acetates, acrylic and vinyl type coatings, etc. To these the demands of war have caused the addition of several new types, such as the silcones, allylresins, polyethylene and styrene plastics and coatings. It must be kept in mind that in a large measure, finishing coatings are dissolved plastics and that the development of a new and superior plastic is, theoretically at least, the signal for a new line of finishing materials.

Which Finishes Will Be Available Right Away

From this large and growing list the prospective user must choose. What are the prospects of availability? What is the best to consider for at least the immediate initial production? Since the war is not likely to end at one set moment, but probably first in Europe and appreciably later in Asia, availability of material will alter likewise. The end of the European phase should immediately liberate practically all lacquer solvents; it should greatly ease the formaldehyde situation, which will make urea and melamine and phenolic resins comparatively easy. The tung and perilla oil problems will not be helped, nor will the heavy draft on phthalic anhydride for making mosquito repellants for jungle warfare be eased.

Any relief from the present alkyd shortage will have to come from new production or the adequate filling of reserve supplies for army needs. There should be some lessening of the tensity in titanium oxide for white products, but the demands of ships and the smoke bombs will continue at a high level in the Pacific area, and too much should not be expected from the titanium producers. The general linseed and soya oil picture depends on how much of the available supply will be needed as food for the liberated and conquered countries, as well as on our harvests and in the Argentine political situation.

Lacquers, Improved in Some Ways, Will Be Ready

It appears to me that the most available materials at the beginning of reconversion will be lacquers and urea-type baking finishes. With alkyds short, they can best be used as modifiers for these types where a comparative little will go a long way. Considerable work has been done by makers of both lacquer and urea resin raw materials toward improving them for postwar use.

In lacquers several lines of attack toward increasing the solid content of the finish, as applied, have been undertaken with promising results. These consist of: 1) improving the pre-war technique of applying lacquer hot to reduce its viscosity and thus get

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30% to 40% solids at the gun instead of 20% to 25%; 2) developing viscosities of nitrocellulose appreciably below even the ¼-second type; 3) cooperating with resin makers for very low-viscosity modifying resins; and 4) improving solvent mixtures so as to reduce still further the inherent viscosity of the lacquer. It can be safely predicted that postwar lacquers will be of appreciably higher solids if the user so desires. The preference of makers of high-quality goods for several thin coats instead of one heavy coat is still unimpeachable in my opinion, and we will probably see both types of finishing carried on.

Urea-Type Bake Finishes Improved Too—and Available

In the urea field, improvement of pre-war attempts to develop low-temperature baking products that will give high-solids, a drying schedule of one to two hours at 140° to 150°F., and a hard tough film that will polish or dull-rub, have been perceptible. It is too early to predict how this will affect wood finishing, but it is quite probable that this type of finish will find a definite and growing place in the industry. As vehicles for refrigerator, washer and similar metal products, melamine and urea types achieved high distinction before the war, and with better modifying agents they seem certain to occupy a still higher position in postwar production.

Shorter bakes, better color retention, better adhesion—all are to be expected. It is possible that for articles where high-heat is encountered, a silicon-base resin may become available eventually. These finishes have outstanding heat resistance and may be of great value for finishing stoves, toasters, electric irons, waffle irons and other similar appliances. The silicon resin output is practically all channeled to war, and the present and projected output is still small. Eventually, however, some important developments in this field should be available for consideration by the manufacturer and finisher.

Choice of Good Finishes for Wood and Metal Products

The manufacturer of wood products who starts into production before or just after the end of the European struggle, can look forward to: 1) improved lacquers as an air-dry finish; 2) varnishes with pentaerythritol or phenolic resins to improve drying time and durability; or 3) force-dried urea-type finishes. Surely this is a wide enough choice. For civilian metal goods, we again have lacquers that can be adapted either to interior or exterior uses, oleoresinous enamels both air-dried and baked, black japans, urea enamels and possibly, to some extent, alkyd synthetic types. These last will become very abundant as the war with Japan ends and will be widely used by themselves, as modifiers for lacquers, and as an adjunct with urea or melamine baking finishes.

The manufacturer will also be forced to consider finishes from the basis of what his product will be made of. There will be a profligate abundance of magnesium and aluminum, the finishing of which demands an appreciable difference from the methods and materials used on steel or brass. There has been developed a large potential production of plastics of all types. Some of these will need no further finishing; others will definitely require additional treatment. M

(Continued on page 86)

FINISH! FINISH! WHO'S GOT THE FINISH?

Every day in the week, manufacturers come to us with some finishing problem or other. Problems others have tackled and muffed. The challenge is always the same . . . "Can YOU give us the finish we need?" Our reputation for succeeding where others have failed is no mere accident. Over the years, we have amassed bulging files of formulas that hold the answers to a host of finishing problems.

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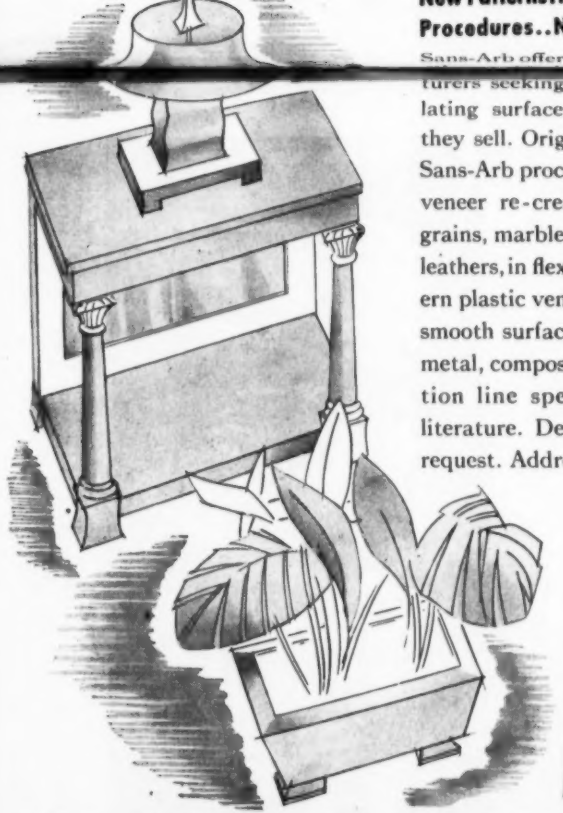

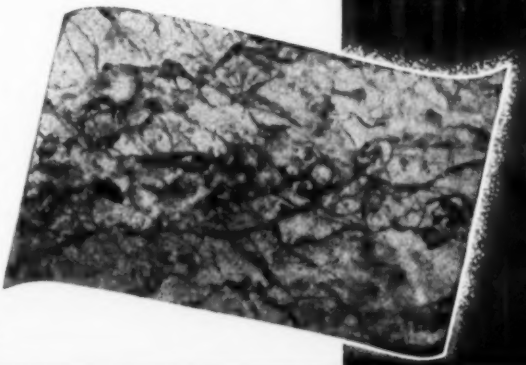

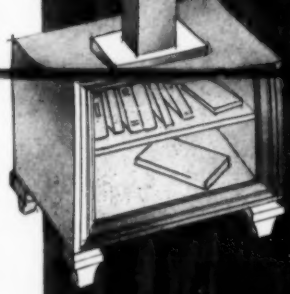

THE MEYERCORD CO.

CHICAGO 44, ILLINOIS

Product Manufacturer must come to an early decision of what base material he will use, and he must be prepared with the proper finishing schedule. He must also decide whether to install ovens for baking the paint coating he uses, or to depend on fast-dry materials. These are not matters that can be wisely left to the last minute.

Temptation to Use Cheap, Skimpy, Perishable Finishes

It is possible that the pent-up demand for consumers' goods will be so great that a cheap, skimpy perishable finish will get by initially. It is to be hoped that few manufacturers will be so short-sighted as to take advantage of this possibility. There will soon come a point of saturation in this demand, and the maker who can point with pride to the performance of his product will have a much better name and be in a much better position than the one who has to apologize.

The makers and appliers of finishing materials have an important function in postwar economy, for then our prosperity will depend on our ability to create a constantly growing desire for new goods. American prosperity cannot survive on a necessity basis; it is fundamentally postulated on a comfort and even luxury standpoint. To make the products of American inventive ingenuity attractive, so that buying is stimulated, is the duty of the manufacturer. A rich full finish that will not go bad prematurely, that will set off the functional values of the article—this is one ingredient in the prescription for a National Prosperity which we all hope can be compounded.

How War Specification Finishing May Affect Future

The purpose of Governmental war specifications was to secure an adequate finish for the article, with a minimum use of scarce materials. The purpose of postwar

Postwar planned finishing will definitely include more conveyorization for moving parts and products to, through and from modern paint spray booths. Photograph supplied through courtesy of the Binks Manufacturing Company.

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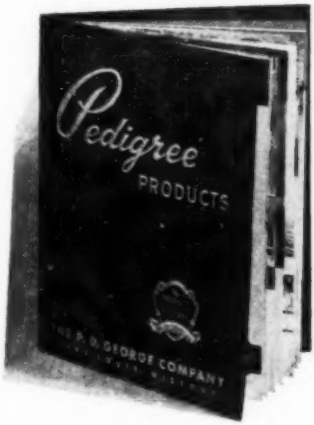

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manufacturers should be to provide their products with the best finish that can be used thereon, both for real attractiveness and for durability. Since the now scarce materials will be available in abundance when the war is over, one can at least set his sights for the maximum, even if initial efforts must be a compromise.

The necessity of finishing many items on a high-speed mass-production basis has given an impetus to automatic spraying, dipping and rolling equipment. We will see an increased use of these methods in postwar finishing. Such auxiliary improvements as infra-red heating, ultra-violet acceleration of oxidizing finishes, electrostatic detearing, etc., are also to be considered.

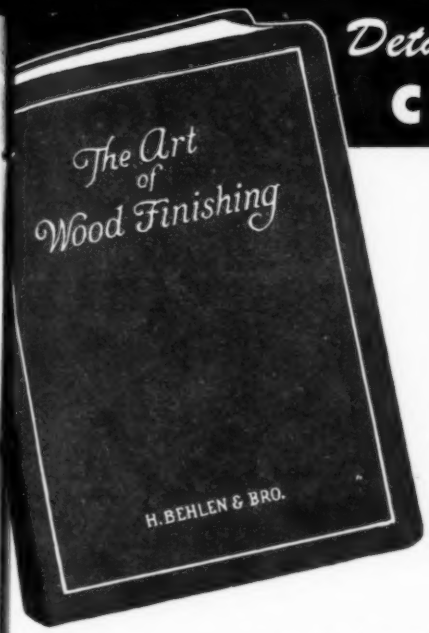
Truly there is much that is new, much that should be given serious thought before setting up your postwar finishing schedule. The initial output will, of necessity, be chiefly along familiar lines and the newer products and processes will gradually develop as time goes on, as competition gets keener, and as the public becomes more critical in its consideration of the finish on products it buys. It is none too soon for every manufacturer to start getting ready for the new production race which the end of the war will signal.

Moves and Tilts Filled Drums—To be able to lift a drum of finishing material to comfortable working height, and tilt it so that part or all of the contents can be poured into containers, is something well worth while in any finishing room. When a handling unit that will do this is made in the form of a truck, so that it will also transport the lifted drum to any point in the plant, it is doubly useful. One piece of equipment incorporating these advantages has a U-shaped handle which connects with suitable links to a saddle that fits around the drum to be handled; the saddle is secured around the drum with a chain and locking lever.

Pulling down the U-shaped handle just a little lifts the drum from the floor, for trucking to another point. Pulling the handle still farther down hoists the drum to its top position and, at the same time, carries the connecting links to a point beyond center, so the drum is locked in "up" position. Then it can be tilted by easy manual effort, but will return to upright position when it is released.

Solvent Recovery—Recovery of paint through the use of a water-wash booth is one thing, and the recovery of solvents from drying lacquers is another thing altogether. There are some cases where the recovery of solvents from drying lacquers is distinctly a paying proposition. At least one firm has provided equipment for the purpose.

Small work pieces that have just been lacquered are placed in trays, and these trays are put in place in a special metal tank. This tank contains oil; also steam coils for applying heat to hasten the drying. The oil surrounds the work-holding trays and therefore distributes the heat better. A special cover is rolled into place over the top of the tank. Assembled on the cover is a condenser which turns the rising lacquer solvent vapor into liquid and delivers it to storage so that it can be used again. Such equipment is subject to specification, as touching size and work capacity.



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Future-Product Plans and Push-Ahead Ideas

Thoughts, ideas, suggestions along lines of future civilian production, including painting and decorating new products.

BY W. BEACHAM

MANUFACTURERS I have talked to are ready to convert to peacetime activity but they still remain hazy as to finishes for their products. The majority of manufacturers are leaving the finish up to the paint supplier. He, in turn, is waiting to see what his customers require, which leaves us all up a tree. However, I don't believe we will have very much to worry about. There are several new finishes on the market and I believe that after the first rush to supply shortages is over we will be able to produce, with our automatic machinery now in operation on war products, finishes that will be pleasing to the eye and cheaper than those produced before the war.

An Idea Suggested for Venetian Blind Finish

I have already suggested to one large Venetian-blind manufacturer a rather unique finish. I have noticed that throughout America, unlike Europe, the majority of houses with Venetian blinds do not have window curtains. Then let's blend the blinds to suit the decorations. Have you noticed how the most glorious colored birds blend in with their surroundings? Take for example, the Swainson's Laurakeet, an Australian bird of very bright irridescent colors. Alone he is a beautiful and outstanding bird, but in his natural haunts he blends in with the background.

I would not suggest finishing the blinds to look like a bright colored bird but, after looking at the bird, take a trip to the nearest museum and look at the antique vases that were buried for several hundred years. The irridescence of those vases is beautiful, but of a dull sheen. Then tone the bright color of the bird down to that of the vase and the result is a very beautiful color for Venetian blinds. This smart use of color makes for a lovely home, increased sales in Venetian blinds and, what's also important to production men, this finish can be roller-coated, resulting in less paint used, increased production, and greater profits.

Advancements Made Through Our "Push-Ahead" Activities

Plastics, of course, will be way out in front now that we can produce plastics to resist: 1) hammer blows, 2) solvents, 3) tendency to check, and 4) plastic "memory" (that is, the tendency to return to its original shape when heated). We can dye plastic, paint over it, and chrome plate it. We can mold it, cast it, and cut it to shape. We can flow coat it, spray it, and use it as a wood and metal preservative.

But the general trend, at present, is postwar planning. In some fields

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NOTE: Non-Alkyd Black No. F4264 and Non-Alkyd Olive Drab No. F-4273 have the acceptance of the Army Service Forces under the TAC-ES-680b Specifications.

Write Our Industrial Finish Division

YOUR INQUIRY WILL BE GIVEN PROMPT ATTENTION

ENTERPRISE PAINT MFG. CO.
PEORIA & VAN BUREN STS.
CHICAGO 7, ILLINOIS

I find manufacturers out to push ahead, with the thought in mind: "To blue blazes with old-fashioned conservative methods. Let's get ahead." A few others are conservative, and that's putting it mildly. They are conservative to the point that it hurts. You know fear is a terrible thing to a manufacturing concern. I often wonder if it is ignorance, old-country penny-pinching training, or just plain fear of making a mistake. Those same people who are afraid to try new ideas seem to forget that it is the good old American custom of willingness to gamble that has put us so far ahead of other countries.

Attractively Finished Products Give Us a Mental "Lift"

The durability, attractiveness and versatility of finishes on our products have given the whole country a "lift"; and finishes of the future, without forge-ahead-regardless-of-cost methods, will lift us even higher than we are today. You may care to question this statement. Let me explain what I mean. The automobile of a few years ago was painted after the European style, one slow-drying coat upon another until a very high polish and a lot of paint covered the body. Often it took over a month to complete the paint job. American industry gambled and won. Now it takes only a matter of minutes to do a better job. And that is only one field.

I believe business statistics show 11 years is the average life of a specified line of business. Because the conservative manufacturer has made money in this one line he seems to think he can continue to do so without making changes. Let me point out, sir, statistics don't lie. I for one am 100% with the venturesome go-ahead-and-gamble method of doing business. This not only applies to the manufacturer of articles for retail markets but to the manufacturer of our finishing equipment.

"Wild" Ideas and the Possible Follow-up

The other day I was chatting with a kitchen cabinet manufacturer and mentioned the low cost of operating high-frequency electricity, and how simple it was to cook a nice juicy steak in a few seconds.

"Just imagine," I said, "friend wife coming home from a bridge party five minutes before her husband is due. She could slip the meat and vegetables on a small conveyor that passes through the high-frequency unit, and then remove the completely cooked meal from the conveyor in two or three seconds."

The manufacturer's remark was: "Believe it or not, you've got something there." And this man is actually going to work on this one item.

There is also on the horizon another method of applying finishes. That is the possibility of mixing paint with that wonderful product Freone, which is being so successfully used as an agent for spraying insecticides in the South Pacific. If this can be done with any success, a fog of paint would hang in the air at least long enough for electrostatic methods to come into full play, drawing this fine fog of paint onto the articles to be finished. Of course, several changes will be necessary in the formulation of paints, but with the aid of plastics, I think we can find something that will readily mix with Freone and still not dry out too rapidly when in the fog stage. It's worth thinking about.

Fluid Power Equipment by Oilgear Wears Finishes by Lowe Brothers

The Oilgear Company of Milwaukee, Wisconsin, is a pioneer of outstanding advances in fluid power application. Oilgear Fluid Power Systems of every type are speeding production by accurate, flexible control of speeds that are steplessly variable throughout the entire range.

In brief, Oilgear furnishes a well known standard of dependable power accurately controlled for America's military and industrial might.

Over the years, Oilgear has been a consistent user of Lowe Brothers finishes for dependable protection of their products.

Oilgear, and many other makers of precision equipment, know that Lowe Brothers finishes are made as a result of thorough study of product requirements and laboratory research. This skill in manufacture assures the right product—whether it means one to stand up under cutting compounds, greases, alkalis, unusual moisture conditions, or many other varying work and exposure conditions.

And whatever your finishing problem, you may be sure that Lowe Brothers experience in serving industry is yours to command.

INDUSTRIAL SALES
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DAYTON, OHIO

Lowe Brothers
FINISHES for Industry

Questions and Answers

Lacquer is Brittle and Scrapes Off Easily

We are having considerable trouble in our finishing department. First of all, we do not seem to be able to get a hard finish. Our finish mars easily. Secondly, it is possible to scrape off this finish with your fingernail, almost in a layer, leaving the stained wood exposed. This latter condition is the more serious of the two.

We are using and have always used first class lacquers and thinners. We would appreciate receiving any suggestions you may care to offer. One thing in particular would be a formula for a good stain and a good filler for use with lacquer. Also, an outline of what you consider a proper procedure to obtain a good lacquer finish on wood.—J. STORE FIXTURE CO.

The difficulty you are encountering is primarily one of adhesion. Even *the best lacquers that can be made will appear to be brittle and will mar easily when the factors that cause poor adhesion come into play.* I will describe some of the materials and conditions that give rise to poor adhesion. Any one of them can cause the difficulty you mention.

The first thing to consider is the stain. In general, water stains and non-grain-raising stains give the best adhesion. However, a very slow-drying non-grain-raising stain may cause trouble if too much of it is applied. This is because such stains contain a very slow-drying solvent or "heavy end" whose purpose is to wet the wood and provide the necessary penetration. If the wood is very hard, much of this heavy end may not be absorbed and will remain on the surface. A sure test is to rub the surface with your finger tips just before the next operation (wash-coating, filling, or sealing). If there is a wet or oily film on the surface, then this stain fixative is indicated as a possible source of trouble. Longer drying time for the stain may eliminate the trouble. Careful wiping may be helpful. I would suggest investigating this angle in collaboration with your supplier.

Oil and pigment stains tend to give poor adhesion, particularly if very much is left on the surface or if they are not allowed to dry thoroughly. Overnight air drying or force drying one to four hours at 110° to 130° F., will provide the necessary drying. Even then, adhesion of following coats will not be as good as over water or non-grain-raising stains.

The wash-coat is not likely to cause trouble.

Your filler might bear investigation. Some fillers are better than others in regard to adhesion. Too much oil in the filler might cause your trouble. I would suggest a filler made on a synthetic-resin base as being the best for use under lacquer finishes. Insufficient drying of the filler will give rise to poor adhesion. Overnight air-drying or one to two hours of force drying at 135° F. will provide the

THE WATSON-STANDARD CO.

PROTECTIVE COATINGS

RESEARCH DEPARTMENT

TECHNICAL DATA

Product: CLEAR-COTE

Code: V-2584

Suggested Use: A Clear, general purpose, finishing varnish for use over metal lithographing

Type Coating: Oleo-resinous

Physical Constants:

Solids: 38 % *Wt.* 7.3 *lbs./gal.*

Viscosity 20 seconds @ 77°F. #4 Ford Cup.

Surface: Lithographed, black, bonderized, and tin plates

Application: Roller coating machine

Recommended Reduction: Apply full body as received

Suggested Film Thickness: 9 millimeters Pfund Gauge (wet)

Drying: Bake 15 to 17 minutes at 260-265°F Peak temperature

Pertinent Information: CLEAR-COTE V-2584 displays excellent flow, high gloss, fullness, and superior coverage over multiple colored lithographing. It is suggested for use as an economical, presently available, transparent finishing varnish for articles coated prior to fabrication for example cans, closures, and crowns.

Write for sample and more detailed information

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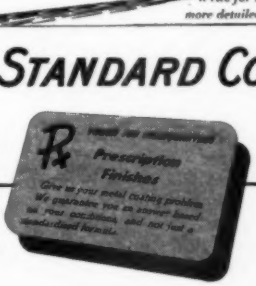
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necessary drying in most cases.

Lacquer sealer is the cause of most adhesion troubles. A lacquer sealer that sands freely after air-drying 20 to 30 minutes simply ruins adhesion, because the maker is forced to use too much sanding agent, which results in producing a brittle film. If you can tolerate two hours of real air-drying or 45 minutes of force-drying before sanding, your supplier can furnish you with a much tougher material which will provide better adhesion. Don't insist on too quick or too easy sanding, because you may easily spoil your finish by doing so. Also, the sanding agent will settle to the bottom of the container after it stands a few hours. If you withdraw material from the bottom of the container without stirring it, your sealer may contain an excess of sanding agent. The film will sand easily, but it will be soft and far from tough. Be sure to keep the sealer well agitated at all times so that the sanding agent is in uniform suspension.

Pigment wiping glazes may cause troubles similar to those of pigment stains. Most glazes, if too much is left on the wood, will cause poor adhesion of lacquers. Do not leave too much on, and be sure the film is dry before coating.

Finally, some dead flat lacquers give soft, cheesy films that are easily marred. Those made with stereates are particularly apt to cause trouble. Select flat lacquers with care, and test them on glass or metal by scratching the film with a knife. You can readily pick out the toughest ones in this manner.

Do not pile up too heavy films of lacquers all in one day. Four or five coats a day without force drying are too many. The film may require weeks to become thoroughly hard. One coat of sealer and two coats of lacquer are sufficient for most purposes. I would suggest that a good system for most cases consists of water or non-grain-raising stain, wash-coat, filler, lacquer sealer, and two coats of lacquer.

There are many other possible causes of poor adhesion. However, those outlined here cause perhaps 90% of adhesion troubles.—ROLLIN H. WAMPLER.

Frosted Glass Effect

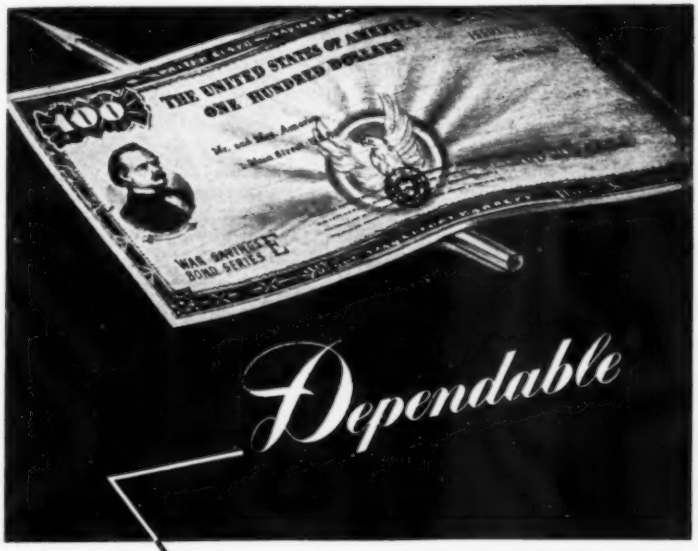
We are wondering if you could help us obtain an air-drying spray material to be used on clear glass—a coating that will give the effect of etching or frosting? Such a product is being made but we are unable to learn the name of the manufacturer.—L. X. Co. (Lighting fixtures).

Perhaps you have in mind "Windo-Frost" which is an oil paint for use on inside surfaces of glass windows and skylights to control the amount of direct sunlight passing through.

According to the manufacturer, The Debevoise Co., Brooklyn, N. Y., "Windo-Frost" is furnished in white, light gray, light blue and light green. It can be made in any desired color.

This permanent frost coating, according to the color used, limits the progress of actinic rays of the sun which, because of their fading effect, are frequently so destructive of stock in process of manufacture or in storage. If used as received in the container, it applies easily, dries quickly and provides a uniform opaque coating which adheres firmly and furnishes economical protection against undue glare.

If your need is in connection with the frosting of fixture light-



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Paints for Industry THE ARCO CO.

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ing, then The Debevoise Co. does not recommend "Windo-Frost." There are materials made particularly for that purpose, among them being those made by The McKay Co. of Brooklyn, N. Y.—ED.

Automatic Fire Alarm—Signals of various kinds are used throughout industry. Alarm signals that indicate the presence of fire are of decided value in various places, particularly in finishing rooms. When you have specific localized areas where the fire hazard is greater than ordinary, as around spray booths, dipping vats, etc., some sort of alarm that can be placed in the danger area is especially protective.

One type of alarm explodes two blank cartridges, one a few seconds after the other, by the action of temperature sensitive fuses. The first fuse releases a firing pin to fire its cartridge when the temperature reaches 160° F. The second fuse is designed with lagging characteristics, which causes it to explode its cartridge a few seconds afterward. Springs in the layout are constantly pulling in such manner as to actuate the firing pins, but are restrained from acting by the fuses, until the fuse links melt. Celluloid washers surround the pin housings near the fuse, to accelerate the melting action at the required temperature. When the fuse links melt, the springs are released, and the cartridges are fired.

Spray Painting School Classes

Four one-week classes will be held for industrial finishers in the first half of the 1945 School of Spray Painting, to be conducted by The DeVilbiss Co., Toledo, Ohio. Sessions starting January 15th, March 12th, April 16th and June 18th, each including the same classroom instruction and shop work, will be open to all regular users of DeVilbiss spray-painting equipment.

Materials Supplies Equipment

Moisture Detector

The Delmhorst Moisture Detector is an electrical instrument for determining the moisture content in wood or other materials before, during or after manufacture. Electrode needles penetrate the surface, without marring it, and measure the moisture content accurately. The instrument operates on batteries and weighs only 6-lbs.; a product of Colloid Equipment Co., Inc., 50 Church St., New York 7, N. Y.

"Alumox"—Protective Coating for Aluminum

According to a bulletin released by The Enthone Co., 441 Elm St., New Haven, Conn., Alumox fills the need for a simple chemical treatment for aluminum and its alloys—to give them protection against corrosion and make them receptive to organic finishing. It requires no electric current or special racking.

Immersion of aluminum in the Alumox solution produces a hard, thin but highly protective, corrosion-inhibiting coating. The finish will withstand severe bending and cannot flake off. It varies in color from an iridescent grey to a deep greenish grey.

High salt-spray resistance is obtained with non-copper-containing aluminum alloys. Aluminum alloys 2S, 3S and 52S are protected with over 260 hours of salt spray resistance by a 15-minute Alumox treatment.

a finish with a future ... using SANTOCEL

2 or 3 times more efficient than other flatting agents

LACQUERS, or synthetics containing SANTOCEL, Monsanto's totally different flatting agent, provide finishes with many unique advantages:

1. Improved surface hardness
2. Clear, non-hazy surfaces
3. Improved resistance to marring
4. Flexibility
5. Quality, de-lustered appearance
6. Improved adherence to surface
7. Improved resistance to heat

Many manufacturers of lacquers, and synthetics have become acquainted with Santocel's superiorities in making non-specular finishes for war usage.

When the war is over, these manufacturers and others can look forward to a general demand for these qualities in finishes for civilian goods.

Meanwhile, for more information on Santocel, write, wire or phone: MONSANTO CHEMICAL COMPANY, Merrimac Division, Everett Station, Boston 49, Massachusetts.

MONSANTO CHEMICALS

SERVING INDUSTRY... WHICH SERVES MANKIND

Copper-containing aluminum alloys, such as 17S and 24S, are protected to about 40 hours in salt spray before the first signs of white corrosion appear. For non-copper-containing alloys the protection afforded approaches that obtained by chromic acid electrolytic anodizing.

The Alumox coating is hard and stands normal handling, but being thin (0.00005-in.), it can be abraded through by rough surfaces. It is similar to chromic-acid anodized coatings in abrasion resistance.

Alumox surfaces are excellent paint bases for all types of organic finishing—painting, lacquering, enameling. They are both absorptive and adsorptive to give the paint a "tooth" for bonding. In addition, the corrosion-inhibiting surface prevents lateral corrosion which is frequently the cause of blistering and peeling on "unprepared" aluminum surfaces that have been painted.

The Alumox solution is made by dissolving 4-oz. of salts in each gallon of water. The bath is heated to boiling temperature. Treating time is from 5 to 20 minutes. Only a plain steel tank is required as a container. Patents are pending but there are no royalties on Alumox.

Flame-Resistant Chromate Gaskets Replace Rubber

A new type gasket, consisting of a felt base, impregnated with a chromate pigmented compound which renders the material flame and fire-resistant as well as corrosion-resistant is announced by The Sherwin-Williams Co., Cleveland, Ohio. Originally intended as a substitute for low-pressure rubber gaskets required in marine ventilating systems, chromate gasketing has since demonstrated its usefulness in many other applications, including joint seals in water, fuel oil and diesel oil systems as well as gasketing for air lock and refrigerator doors.

A chromate gasket will maintain air pressures up to 25-lbs. per square inch at normal temperatures. In addition to fire and flame resistance, it is not affected by fuels and has definite rust-inhibiting properties. Chromate gasketing is dark green in color and is available in two thicknesses, ⅛-in. and 1/16-in. In addition to its original application for sealing joints in air ventilator lines, forced draft blowers and similar equipment, chromate gasketing may be used in flange-to-flange joints in drainage, fire main, fresh water, flushing, sprinkling, plumbing, fuel oil and diesel oil systems. It may be employed for watertight or oil-tight connections to structures and as gasketing for air lock doors, air lock relief valves, jointer doors, refrigerator doors, flame-resistant closures.

Explosion-Proof Motor

A new explosion-proof electric motor has been developed by the Warren Telechron Co., Ashland, Mass. This motor is totally enclosed in a bronze casting, with removable screw cover and adapted for explosion-proof conduit mounting. It can be supplied in various shaft speeds, voltages and frequency.

This explosion-proof motor was developed primarily for use in connection with automatic controls used in industrial processes where atmospheres containing ethyl ether vapor, gasoline, petroleum, naphtha, alcohols, acetone, lacquer solvent vapors and natural gas are found. The motor carries Underwriters' approval label, Class 1, Grade C and D, for hazardous locations.

Spray Booth Coater

"Booth Kote" is the name of a temporary or removable coating for the interiors of spray booths. Its purpose is to catch and hold the overspray so that this accumulated paint material can be quickly and easily removed at regular intervals.

Doster's Booth Kote is a soft, white, creamy paste that adheres lightly to the smooth metal surfaces of a clean spray booth. It is impervious to all

In war or peace, Pratt & Lambert-Inc. makes good industrial coatings. Doing just that, nearly one hundred years.

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solvents except water, therefore the various spray solutions have no effect on its surface. While it easily peels off the metal, its adhesion is great enough to hold a very heavy load of lacquer overspray. Booth Kote is applied by spreading it on with a brush. A boy can do the job and have a good time doing it.

After using the booth until the walls are loaded, just peel off all the accumulation of paint or lacquer with an old knife. The coating will peel off as easy as peeling a banana; and the walls are ready for a new coating of Booth Kote. This material is a product of Doster & Co., 4840 W. Superior St., Chicago 44, Ill.

Chlorinated Isopol

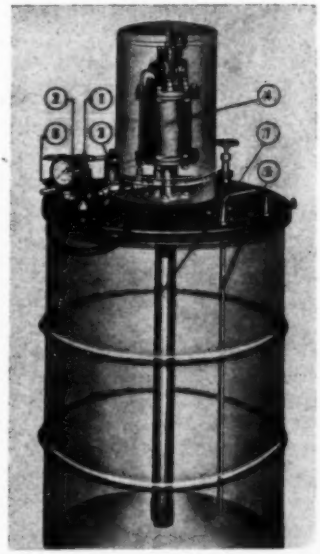
The Union Bay State Chemical Co., Cambridge, Mass., has announced the development of a new synthetic, Chlorinated Isopol, available in metal-primer formulations and in powder form, that is practically identical to chlorinated rubber in flame resistance, moisture resistance, chemical resistance, solubility, stability and compatibility with plasticizers.

Suggested as of unusual interest as a primer for rubber-to-metal adhesion; as an ingredient in adhesives, paints, lacquers, inks, etc.; as an acid and alkali-resistant coating for metal, concrete and other surfaces; for fire-proofing and/or moisture-proofing fabrics and other materials; wherever sound and heat insulation qualities are desired; and as a plastic wherever inertness to chemicals and fire-proofness are of importance; Chlorinated Isopol is the outgrowth of a completely original synthetic rubber formulation developed in the UBS Laboratories.

Production of Chlorinated Isopol is sufficient at present to enable sampling and service of reasonably sized orders, but large quantity orders can not be filled until new expanded production facilities are in operation. All inquiries should be addressed to the Union Bay State Chemical Co., Rubber Chemicals Division, 50 Harvard St., Cambridge 42, Mass.

Pumps Material From Drum to Gun

First complete details on the Alemite "Versatal" material pump, used by the U. S. Navy for applying a secret anti-fouling paint on ship bottoms, termed one of the war's greatest naval discoveries, have been announced by the Industrial Alemite division of Stewart-Warner Corp., 1826 Diversey Parkway, Chicago, Ill.

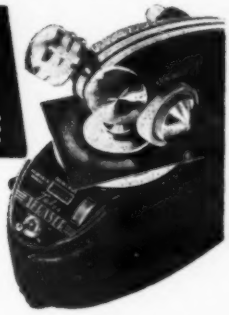


The equipment mounted on head of a material drum. 1 is air regulator; 2, air pressure gauge; 3, air motor oiler; 4, air-motored pump; 5, automatic agitator; 6, dual air and material line outlets; 7, intake pipe.

It was revealed that more than 500 of these unusual new pumps are now in operation both in this country and abroad. Until recently a rigidly controlled item, "Versatal" pumps are now available for civilian operations, according to the company announcement.

These pumps present a radical de-

A fast, practical, scientific
PRE-TEST FOR WEAR RESISTANCE



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SPECIALTY COATINGS—I. C. D. Labs. have specialized in the formulation and manufacture of non-inflammable coatings and substitute finishes. If you have a tough coating or finishing problem send in your specifications, finishing schedule and requirements. Immediate action and a prompt reply promised.

INDUSTRIAL CHEMICAL DEVELOPMENT CORP.
347 MADISON AVE. NEW YORK 17, N. Y.

parture in many aspects, from the conventional type of "pressure pot" spray apparatus. They are designed to dispense and apply a wide variety of materials, including paints, lacquer, mastic, sealers, insulating materials, fibre and cement coatings, caulking compounds, etc.

"Versatal" pumps operate on air power, and from one to six operators may work simultaneously, using as many different spray heads and material lines from a single pump.

The material is delivered from the pump at pressures 4½ to 5½ times air pressure introduced to the "Versatal" pump. It supplies material through several hundred feet of hose, thus making it possible to reach places heretofore difficult for spraying operations.

Mandrel-Mounted Polishing Bobs

Users of felt bobs for polishing, finishing and deburring metals, plastics, etc., can now secure Paramount brand felt bobs, permanently mounted on ⅛-in. or ¼-in. steel mandrels. The Bacon Felt Co., Winchester, Mass., announces these mandrel-mounted bobs as a new convenience for use with portable air or electric tools, and flexible-shaft equipment. When the felt has worn out, the operator simply slips one of these new mandrel-mounted bobs in place.

Protective Coating for Spray Booth Sidewalls

Triad PR, a new protective coating for the sidewalls of both wet and dry spray booths, is announced by Detrex Corp., 13005 Hillview Ave., Detroit 27, Mich.

With this new coating between the walls and the layer of overspray that normally builds up, a quick and easy clean-up is possible. The booth so protected is stripped clean simply by spraying with water or steam; the Triad PR and accumulated paint flush off together. In the dry booths which have no draining facilities, the protective coating greatly facilitates scraping off the paint.

Triad PR can be applied by either brush or spray gun. It gives excellent coverage, and dries to a hard, white, dustless coating which improves visibility in the booth.

Water-Wash Conditioner

According to Oakite Products, Inc., 32F Thames St., New York 6, N. Y., Oakite stripper M-3, or other recommended Oakite material, can be added to the circulating water in water-wash spray booths for the purpose of serving as an effective "conditioner." The use of properly conditioned water prevents overspray of paint materials from clinging to and building up on the back plates and other washed metal surfaces of water-wash spray booths. Oakite water conditioner serves not only to keep water-contacted metal parts of the spray booth clean, but assists in salvaging the solids of overspray material which accumulates on the surface of water in the tank.

Rolamarkers

Portable "Rolamarkers" are designed to imprint the surfaces of parts, products or packages with single impressions or continuous or all-over impressions of a trademark or other information. Units are available to mark continuous strips 2-in. wide to 10-in. wide. Rolamarkers of this type are used to mark products with information to help the users, or with a manufacturer's identification for reorder.

The printing drum is made to hold fixed dies, interchangeable type, or a combination of both. It is equipped with as many channels as are needed for the interchangeable type. Rolamarkers are automatically inked by one or two self-inking rollers. Assemblies have been manufactured for imprinting in two or three colors side by side.

Units are heavily constructed for many years of service. Frames are

LICKS CORROSION

COREX is an organic finish applied to metal by dip or spray, giving it an enduring protective armor against corrosion by acids, salt spray, humidity, steam and other demons of destruction.

Products coated with COREX have been subjected to corrosive liquids and fumes without deterioration for over 10,000 hours — more than a year.

Available clear and in colors for industrial applications.

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Engineers of Product Finishes

of durable metal; drums are constructed accurately; some are operated on ball bearings; ink rollers are of solid felt, precision ground when required. Rolamarkers are a product of Adolph Gottscho, Inc., 190 Duane St., New York 13, N. Y.

Metal Parts Washer

The Phillips Mfg. Co., 3430 W. Touhy Ave., Chicago 45, Ill., presents a 3-stage metal washing tank with several new features. Designed for use with an emulsifying cleaner or as an alkali washer, it includes a heated solvent tank with two heated water rinse tanks. The heated solvent tank offers a thermostatically controlled range from 135° to 250° F., and a drain board which conducts the "drag out" solvent back into its tank.

After immersion in the cleaning agent and draining, the parts are immersed in the first, then the second rinse tanks. They emerge completely free from oil and dirt. The water rinse is also heated, with a controlled flow that keeps the temperature at about 180° F. An ingenious arrangement provides for the removal of most of the dirt and oil in the first rinse, so that the final one produces oil-free work. The solvent tank is heated by strip heaters and the water rinse by immersion heaters.

The heated tank's walls are insulated and working parts are easily accessible. Two safety covers hang at the side of the tank when not in use and protect the operator from contact with the tank itself.

Letters from I. F. Readers

(Continued from page 10)

ing up—and heated by the use of infra-red lamps for the baking operation.

Since nearly 200 plants manufacture wrinkle coating compositions under license from us, we can show no partiality in any manner, direct or implied, and as a consequence we can recommend no individual manufacturer.—NEW WRINKLE, INC.

Toy Finishing Problem

Kindly forward any information you may have on finishing wood toy blocks. We now dip these blocks (after we tumble them and they are smooth) in a certified pure vegetable color which dries very dull and streaky.

We are looking for a coloring process to dip if we can get it; also, we desire a truer color with a gloss finish. We use red, green and yellow, and dip thousands of pieces at each dipping.—TOYCRAFT.

We suggest that you call in the service man connected with the concern who is selling you finishing materials. If this company has no service man, perhaps you should purchase your materials from another company or from a local concern who can give you the necessary information about the proper use of their material, so as to produce a satisfactory finish.

Our guess is that perhaps you are thinning your material too much. Of course, this is only guess work. It requires an experienced man on the job to diagnose your trouble correctly. That is why we suggest that you obtain your materials from a concern who can send out a man and give you proper service on the spot. Excellent toy finishes and information regarding the use of same can be obtained from any one of several concerns who advertise in this magazine.—ED.

Cabinet-Type Ovens

At the present time we are interested in buying an oven to bake enamel paint. It is our intention to have an oven which would permit us to put in three to six cabinets, size 2x6x5-ft. Would it be possible to locate, somewhere in the U.S.A., an oven that would serve our purpose? —D. U. LTD.

In a letter we are giving you the names and addresses of several manufacturers of cabinet-type ovens.—ED.

Lacquer Rubbing Machines

Can you name some manufacturers of lacquer rubbing machines? We seem to be having difficulty in locating them. We are interested in getting your publication, INDUSTRIAL FINISHING regularly.—F. WOOD PRODUCTS CO.

Information given.—ED.

THE PRIMER THAT FLOWS BACKWARD!

O'Brien's Gray Primer 7062 is a stand-out performer under lacquer, synthetic enamels and government specification finishes. It eliminates all beading at the bottom of the drain and leaves a CLEAN edge. Extremely stable in the dip tank. Non-skinning. Non-settling. Highly adhesive to metal. Applied film is flexible, durable, salt-resistant. Write us for this primer's unusual record in dip tank finishing. O'Brien Varnish Company, South Bend 21, Indiana.

Booklets Catalogs Circulars

Infra-Red Booklet Free

A new booklet reveals practical illustrated information about the Evenray System of infra-red radiant energy for use in quickly curing paint coatings. Adjustable, built-up, portable drying tunnels are shown and explained. For a free copy write The Fostoria Pressed Steel Corp., Fostoria, Ohio.

Wood Finishing Book

"The Art of Wood Finishing," is the name of an informative book about practically all phases of bleaching, finishing, decorating, polishing, refinishing and making repairs to the finish on furniture, pianos and fine hardwood cabinets. It includes painting, gilding, burnishing and polychrome. The price of only $1.50 makes it available to everyone. Write H. Behlen & Bro., 10-12 Christopher St., New York 14, N. Y.

Booklet of Information on Industrial Tape

A new illustrated colorful booklet of 16 pages 8½x11-in., reveals information and suggestions about the use of industrial adhesive tapes on the production lines of many industries . . . and in a variety of factory maintenance work. For a free copy of "A New Tool for Industry," write Industrial Tape Corp., New Brunswick, N. J.

Plastic Coatings Bulletin

A new folder in two colors, titled "Amercoat No. 33 Plastic Coating," describes the properties, uses and benefits of this general-purpose, cold-applied, protective coating. Contains a wealth of factual data relative to the positive elimination of corrosion on equipment and structures of all kinds, as well as the contamination of products resuling from contact with corroded surfaces. Technical facts include application, coverage, colors, degrees of weathering, moisture absorption and transfer, and resistance to chemical fumes, splash and overflow of acids, alkalies, salts, oils, water, etc. Many uses in a variety of industries are described. Write Amercoat Division, American Pipe and Construction Co., P. O. Box 3428, Terminal Annex, Los Angeles 54, Calif., for a copy of the folder.

New Plastics Bulletin Has Full-Color Illustrations

A 4-page folder printed in attractive colors, illustrating the properties of the cellulose plastics family, largest plastics family in industry, has been issued by Hercules Powder Co.'s Cellulose Products Department, Wilmington, Dela.

Designed for nontechnical, as well as technical, readers, the folder illustrates the characteristics—tough, clear, flexible, light weight, colorful, stable, and economical—of a selection of end products made from cellulose acetate, ethyl cellulose, and cellulose nitrate.

Tough cloth-laminated Navy cargo containers, tubing which can be bent and flexed at 40° F. below zero, transparent packages, and many different colored housings for radios, telephones, and flashlights provide an indication of many postwar uses for the cellulose plastics family.

Book on Paint, Varnish and Lacquer Industry

An interesting and informative booklet of 24 pages, 6x9-in., bound between heavy gray paper covers, gives an up-to-the-minute over-all review of the importance, uses and possibilities of paint materials; opportunities in the paint industry (manufacturing, distribution, application); romance of the paint industry, etc. The contents, presented under ten chapter headings, provide valuable reference information for present and future study by everyone who has anything to do with paint, varnish or lacquer materials.

The book was written by Ernest T. Trigg, who for several years has been President of the National Paint, Varnish & Lacquer Association at Washington, D. C.

Title of the book is "The Paint, Varnish and Lacquer Industry." It is a vocational and professional monograph. Copies are priced at only 75c each by the publishers, Bellman Publishing Co., 6 Park St., Boston 8, Mass.

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POST-WAR PLANS
include
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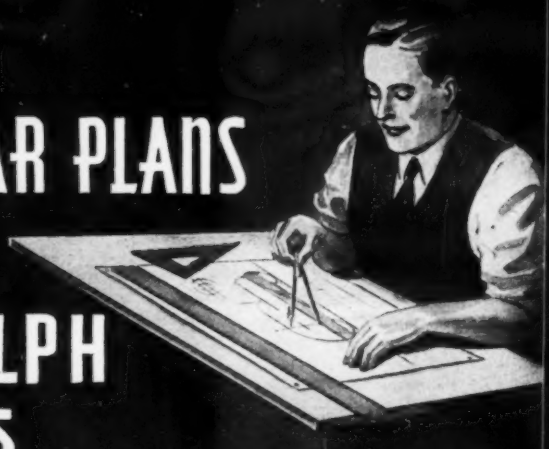
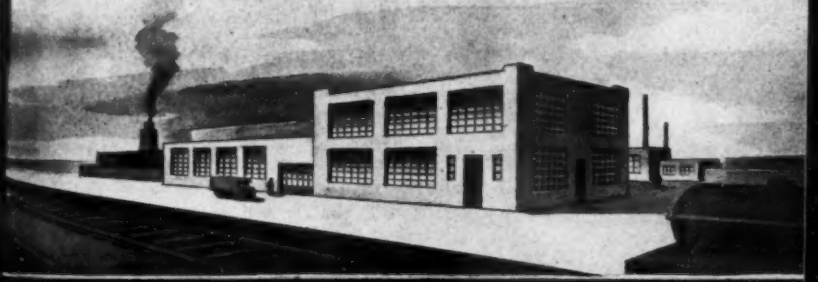


to contribute to the beauty, wear, performance and value of your products

We invite you to consult with our staff of experts on technical matters regarding your finishing problems



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Carlstadt New Jersey

Industrial FINISHING

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Editorial

Postwar Products Planned

Notwithstanding the fact that the European war may be far from over, many industrial concerns are going ahead with postwar plans—and some of these plans are likely to be upsetting to certain old established product designs and methods of production. For example, we read that a certain manufacturer of automobiles is going to make and market farm implements. A large shipbuilding firm plans to manufacture several different household appliances.

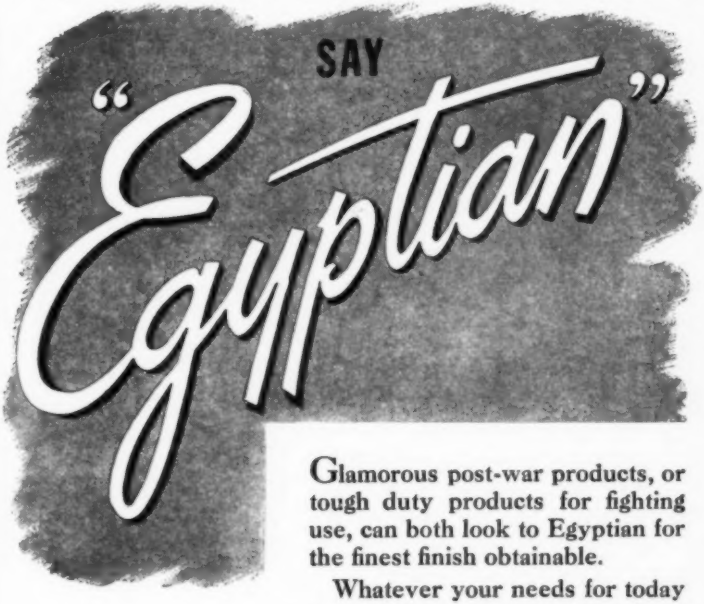
These concerns are well financed and are accustomed to doing things in a big way, so when they tool up for production we can feel assured that their factory layouts, equipment, supplies, materials and methods will be as modern as can be obtained. They will be starting from scratch, but they are experienced in intensified volume production and fortified with plenty of capital. Their management personnel has daring, initiative and originality—and these qualities will probably characterize the appearance and utility features of their products, as well as materials and methods used in their factories.

It is to the interest of smaller concerns, therefore to make a serious study of every phase of modernization that can possibly affect their own probable future activities. Look over your industrial publications more carefully and keep copies on file for frequent reference. Much of the information you will want later is available now where you can readily find it.

Resolution: Keep Your Copies of I. F.

An excellent New Year's resolution, and a practice that should be routine with all users of finishes, supplies and equipment, is to determine to keep on file, for present and future reference, all copies of INDUSTRIAL FINISHING magazine. The original, exclusive, practical and timely information published in every issue of this magazine will help answer vital questions and

To Say "The Finest Finish Obtainable"...



Glamorous post-war products, or tough duty products for fighting use, can both look to Egyptian for the finest finish obtainable.

Whatever your needs for today or post-war tomorrow, there is an Egyptian Finish which will measure up to your most exacting requirements.

THE EGYPTIAN LACQUER MANUFACTURING COMPANY
ROCKEFELLER CENTER, NEW YORK 20, N. Y.

EGYPTIAN FINISHES

EGYPTIAN
SPECIALIZED PRODUCTION FINISHES

solve difficult problems that come up today, tomorrow and in the years to come. Some of the inquiries that are written, telephoned or wired to INDUSTRIAL FINISHING'S office can be immediately answered by referring to one or more pages in a back copy of the magazine.

Reference to your file of back copies may uncover the information you are looking for, or suggest something better than what you had thought would take care of your problem.

Only a few back copies of each issue are retained in INDUSTRIAL FINISHING'S office and when tear sheets of a certain article are in demand, the printed supply of that article is soon exhausted. Reprints of articles are not made unless some concern specifically orders 1,000 or more for its own use, so there is no such thing as a supply of reprints of every published article being on file for distribution.

Remember: What perhaps does not arrest your attention or interest you in this month's issue may be just what you will be looking for next month or several months from now.

Rotproofing Wood With Proper Coatings

Some publicity prepared by Nuodex Products Co., Inc., Elizabeth, N. J., calls attention to the possibilities of preserving exposed wood products which so often are ruined prematurely by decay. It is a subject of timely interest because good sound lumber for use in manufacturing new products or repairing old ones is neither plentiful nor cheap. Anything that can be done to lengthen the useful life of such an expensive material as sound lumber, is worth considering. Quoting from Nuodex News:

"Rotproofing agents seem to offer the best means of increasing the sales of the paint and varnish industry in the postwar years. Rotting and mildewing, however, are very often incorrectly associated with tropical climates. The organization selling a wood preservative may meet sales resistance in the form of a statement, such as, 'But wood doesn't rot here in the United States—that only happens in the tropics.'"

Wood does rot in this country but it could and should be preserved by proper treatment before it is left to the elements. This is something that will command considerable attention in postwar plans and activities.

Buyers Help Design Postwar Products

Come to think of it, the buyer usually contributes a large share toward the design of the products he purchases and uses. He may not mark a line on the drawing but somewhere in the course of developing a design, someone who directed what lines should be used and where they should be placed has correctly interpreted what the purchaser wanted. If such interpretation isn't reasonably correct, the new product will not sell—except perhaps as heavily marked-down distress merchandise.

Many great businesses have been built upon the sound foundation of correctly interpreting just what tens or hundreds of thousands of people wanted. Accordingly, one of the large potential manufacturers of postwar radios is making nation-wide surveys of consumer preferences in reception quality,

Remember Pearl Essence for

PLASTICS

IT IS A magic word with important possibilities for manufacturers in almost every field. The beauty and attractiveness of such products as door pulls . . . hardware . . . face plates . . . toys . . . stands . . . clock cases . . . and many others, made of plastics can be greatly enhanced by coating with Mearlmaid Pearl Essence. Available in all colors and shades including

ALUMINUM . . . GUNMETAL . . . BRONZE
BRASS AND NICKEL

THE MEARL CORPORATION

153 WAVERLY PLACE NEW YORK, N. Y.

Factories

ROSELLE, N. J. EASTPORT, ME.

MEARLMAID PEARL ESSENCE

Priority Rating Is Not Required

Available in Unlimited Quantities

WORLD'S LARGEST PRODUCER OF PEARL ESSENCE

cabinet design and other features, such as tuning controls. The results will serve as a guide to designers and engineers of the corporation (currently one of the largest developers and producers of precision aircraft radio and wartime communications equipment in the world) in giving the postwar radio-buying public what it wants.

Of course, this isn't exactly a new idea. We recall that many years ago, in one town, a local manufacturer of novelty furniture made a practice of giving parties for the ladies, and at those parties he exhibited his proposed new designs. He arranged for the ladies to make criticisms and suggestions and give forth with whatever they felt inclined to say. Refreshments were served and there was music and pictures. Prizes were awarded and gifts distributed to make these parties especially desirable to attend.

This manufacturer knew that ladies buy most of the novelty furniture at retail stores, therefore he invited representative lady retail buyers to help design his products. His idea produced excellent results—even though it was confined to this one locality. More manufacturers will probably make it a point to obtain ideas, suggestions and recommendations from their prospective buyers before they finally decide upon designs, finishes and decorative features of their postwar products.

The great research laboratories which have been established in America since the last war represent a national asset of extreme importance in the solution of future problems, particularly the problem of providing adequate employment at our high American standards.

Invested vs. Expended Executive Ability

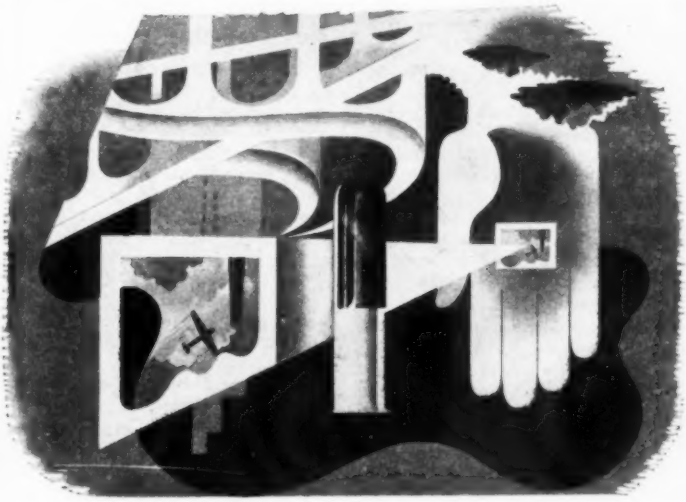
★ Management is definitely a matter of importance in the product painting department, plus the departments immediately before and following paint application; for example, surface preparation, cleaning, stenciling, striping, application of decals, baking, rubbing, etc. One man may supervise all of these departments in a certain plant. If so, he is sure to have a lot of detail work—unless he develops and practices real management ability.

Whether the foreman uses or invests this highly specialized ability, will not show at the end of the day. He may have used just as much energy and feel just as tired one way as the other. However, in a year or two the real difference will be plainly seen. The foreman who allowed his energy to be expendable will find that it still requires the same amount just to "keep even" with his job. But the foreman who has been investing part of his ability will start getting his returns. He will either: (a) get the same amount of work done with less effort, or (b) have time and vitality left for the matters that lead to advancement in his field.

Take, for example, a task consuming approximately three hours of the foreman's time each week. He believes he is best qualified to do the work himself—and as long as he fails to train someone else for it, he's unquestionably correct.

(Continued on page 116)

★ Guest Editorial . . . Many readers can write an excellent editorial—two or three paragraphs that present a timely suggestion or valuable idea which will stimulate real thought on a live subject. The Editor welcomes guest editorials and pays for those that are published.



VISIONARY DREAMS

In test tubes fired by war, chemical research has laid the foundation for far-reaching prosperity. New products have been created, new bases developed, new techniques evolved which stagger the imagination . . . which translates today's dream into tomorrow's demand. How this research will affect your business, what it can do for your product, is obviously impossible to ascertain except by expert examination . . . and such examination should certainly be included in your post-war planning. Our staff of expert finishing engineers will be glad to cooperate with your organization. Your inquiry incurs no obligation. Address The Stanley Chemical Company . . . manufacturers of Stanley Lacquers, Synthetics, Enamels and Japans . . . East Berlin, Connecticut.

Stanley Chemical

Holding to that attitude, at the end of the year he will still be using those weekly ability-hours for the same purpose.

But what happens if he invests his ability instead of expending it? Provided the work is as difficult as he thinks it is, he may need to train a helper during three, four, or even more of those weekly sessions. Then, having invested his ability, he collects his dividends by having possibly half an hour a month supervision, instead of three hours a week of routine.

On a day-to-day program, it frequently looks easier for the foreman to use the time required for a task, rather than invest just as much time in preparing a helper to do it. If the foreman will study a typical week, and note the occasions when he used up executive ability instead of investing it wisely, no one will need point out to him the considerable accumulation of minutes that should have been saved for matters more important to the efficiency of his business and to his personal success.

Executive ability is limited on one side by available energy, and on the other side by available time. To invest a part of the foreman's ability for future returns does not differ greatly from the investment of money. He cannot save all his income nor will he want to use it all for the demands of the day, so he strikes a sensible balance between spending and investing.

To do the same with executive ability calls for even more skill and planning. However, a consistent program, based on that principle, pays well not only in the conduct of his business affairs, but in giving the foreman the necessary reserve of energy and time to reach out for the personal success he deserves.—G. M. D.

Call for Action—Not Day Dreams

★ This is a timely tip to all managers, engineers, purchasing agents and foreman finishers. As we sit and dream of the things we want to do in the postwar days, let's start actively planning for it now and have it ready when victory comes, so we can start rolling. One thing we must keep in mind, after this war is over, is that there is going to be keen competition in all products on the market; and if we don't iron out our bottlenecks and find short cuts to economical production, we are going to face a larger problem than we ever thought of.

One thing to do is to check over your plant and start laying out your floor plans, to see if your present equipment is going to answer your future finishing problems. The modern conveyor type of finishing that is being used now can be set to work on your civilian production. As far as space is concerned, these conveyors and drying units can be set up near the ceiling if floor space is needed.

Automatic spraying and water-wash spray booths are some of the things that will fit into your civilian production setup. Also, check up on your baking or drying units, and see if you can't install modern infra-red ray lamps or gas-fired drying units, so you can cut down your drying time and do away with the guess work that prevailed heretofore. An oven with a modern heating unit, thermostatically controlled, is foolproof—and you will be sure to get your accurate drying time for adhesion, durability and sales appeal.

Take time to talk over your paint problems with your paint suppliers. Explain to them what

In redesigning your Product . . consider FLOCK

Hundreds of new uses for Flock (finely cut fibres applied to many types of surfaces) are being discovered by industry. What can it do for you?

DECORATIVE

Applied in various lengths and colors to wood, paper, cloth, metal, etc., the following effects are produced—

SUEDE LEATHER—FURNITURE UPHOLSTERY FABRICS—AIRPLANE AND AUTO UPHOLSTERY FABRICS — VELVET — VELOUR — MOHAIR.

FUNCTIONAL

Used in airplane, auto and numerous other industries for—

SOUND DEADENING — TEMPERATURE INSULATION — INTEGRAL GASKETS — SHOCK ABSORBING SURFACE — NON-MAR SURFACE PROTECTION.

Request Samples and Prices

RAYON PROCESSING CO. of R. I., Inc. 55 TREMONT ST. CENTRAL FALLS, R. I.

Just for the Record

REMEMBER THESE NAMES

After V-day they will mean something to you!

▼

CEL-U-LAK

A complete line of cellulose derivative lacquers and enamels.

▼

FORM-A-ROC

A unique line of quick-baking, tough adhesive synthetic enamels.

▼

THE VARNISH PRODUCTS CO.

5208 Harvard Avenue Cleveland, Ohio

you have in mind, and let them send you some samples to test and check over for all the paints you may need. Also check on the best solvents to use in the postwar days, so you will know that you are using all of the proper materials for your products. By taking this timely tip, you will eliminate a lot of headaches, and be able to keep one step ahead of your competitor.

The idea today is that if you want to be modern you have to keep up with the ways and products of finishing material manufacturers, who are striving to help keep you modern.

Inasmuch as we have found that dipping is a big factor nowadays, I suggest checking into the new electric detearing field that is now used by some of the jobbing shops. It can be run satisfactorily. Also, check into the new type of automatic spraying conveyor with the swivel spraying arm that can cover from 1-ft. to 4-ft. of space at a time. Let's all get down to facts and be ready for the great V Day. —H. FORD.

Stenciled Sandblasting—Various designs and lettering carrying a great deal of sales appeal can be and are put onto many different products by means of a sandblast, using special sandblasting stencils to cover those areas of the work which are not to be subjected to the blast. Such stencils are made of rubber-covered steel. Rubber is used for two reasons. It resists abrasion strongly, and therefore such stencils last a great deal longer. Rubber also prevents the stencils from scratching highly-polished metals, plastics, etc. Some of the firms making these rubber-covered sandblasting stencils also provide spraying stencils to order, to firms who prefer them.

No Television Boom—"I believe that only 10% of the population will be in a position to buy television sets in the near future," declares Lewis Allen Weiss in debunking rosy forecasts of a wild spree in that field. As executive vice-president of the Don Lee Broadcasting System, he has been making careful studies of the potential market.

Weiss contends that television will have to face stiff competition for the consumers' dollars from refrigerators and other household appliances. Ninety percent of our population, in his estimation, will either be unable to afford television sets, or will find difficulty in obtaining satisfactory reception.

* * *

Lowering Trade Barriers—The necessity for high tariffs to protect American industry is a myth that must be demolished. The United States, with few exceptions, has a great competitive advantage over the rest of the world, declares the National Planning Association, in a comprehensive trade report prepared by Stacy May.

Since American wage scales are based on the high productivity of our labor, fear of cheap foreign labor is without real substance, says May, who is economic adviser to the McGraw-Hill Publishing Co. "The traditional fear of im-

DOUBLE STROKE **RED GIANT LIFTRUCKS**

For Skid Handling of Loads up to 5,000 Lbs.

A pleasure to operate—lifts load so easily in two simple strokes of handle which engages lifting mechanism automatically. Load rolls freely on ball or roller bearings and with little effort is brought to exact position desired by wide angle steering handle (75° arc) where load drops gently, cushioned by shock absorber.

RED GIANT LIFTRUCKS are extremely durable and economical. Can often be used in place of or to supplement expensive power trucks. Other models; Single Lift, Side Lift, Tin Plate, and Multiple Stroke Hydraulic.

We also make the famous REVOLVATOR PORTABLE ELEVATOR, Hydraulic Ramp Eliminators, Carboy Dispensers, Barrel Lifts, Platform Skids and Storage Racks.

REVOLVATOR CO.

DESIGNERS AND MANUFACTURERS OF MATERIAL HANDLING EQUIPMENT

342 86th St. NORTH BERGEN, N. J. Since 1904

Just Daub It On

and Scrape It Off

That's all there is to keeping your spray booths clean. A boy with an old brush and a wide putty knife can recondition any spray booth, tunnel walls and fan blades in a couple of hours with . .

DOSTER BOOTH KOTE

This tested and approved protective coating for spray booth walls is an excellent time, work and money saver in every spray room. Daubed on clean walls with an old brush—scraped off, with its paint load as easy as peeling an orange. Try it once—you'll never be without it.

Doster Booth Kote in 5 gal. kits—$6.25 F. O. B.

DOSTER & COMPANY, 4840 W. Superior St., CHICAGO 44, ILL.

Makers of TEXKIN, the Invisible Glove Skin Protector containing Lanolin.

Fine...Fine
Superfine!
Claremont Flock
Finely cut fabric particles, many colors, many types . . . fluffy, yet filling. Excellent for sound-proofing, insulation and surface protection. Also, applied decoratively to assimilate suede leather finishes, velvet, velour and mohair upholstery effects. Full details, samples and prices upon inquiry.
COTTON
WOOL
RAYON
CLAREMONT WASTE MANUFACTURING CO.
The Country's Largest Manufacturers of Flock
CLAREMONT, NEW HAMPSHIRE

ports," he concludes, "is the stumbling block in the way of expanding American foreign trade and investment."

* * *

What Workers Think—In a serious attempt to determine the views of industrial workers, *Factory Management and Maintenance* recently completed a noteworthy poll. The results disclose widespread approval of employers' policies, but not on all counts.

Sixty-five percent of those questioned believe that management's cooperation with unions is satisfactory; 89% say their wages are good or average, and 91% feel they have good tools, equipment and working conditions.

On the other side of the ledger, only about one-third of the workers take the view that they have genuine opportunities for advancement. And in a few industries —notably textiles, leather and some apparel trades—more than half of the employees are dissatisfied with their wages.

* * *

Deflating Optimism — Speaking before the Sales Executives Club of New York, Dr. Julius Hirsch has warned against the lurid prophecies of greatly expanded national income in the postwar period. "I feel a moral obligation," the noted economist observed, "to warn business that these fantasies cannot materialize."

A national income of 142 billion dollars, in terms of 1942 prices, Hirsch pointed out, would entail an annual increase of consumption and employment almost three times as large as ever experienced in this or any other country. He summarized the outlook in these words: "Wishful thinking cannot produce employment for sixty million people."

* * *

Postwar Plane—Republic Aviation, makers of the deadly P-47 Thunderbolt fighter, have unveiled a new amphibian machine for peacetime family use. The big news in the story is the sensationally low price; although prewar amphibians sold from $25,000 up, this plane is designed to be marketed for less than $4000.

The machine will cruise at 105 miles per hour, with a range of 500 miles, and will carry four passengers comfortably. One interesting feature is the rear-mounted engine. An easily-handled flying boat in this price range may open up a great potential market.

* * *

New Sales Technique—If the ambitious plans of the Homasote Co. materialize, leading department stores from coast to coast will soon be selling homes. Nine big firms have already signed up, including New York's great R. H. Macy & Co.

It is expected that complete units will be sold from about $2000 up. At that figure, the structure will contain full bathroom and kitchen equipment, and will be erected in less than a week. Partial prefabrication is involved, of course. The Homasote firm built 5000 homes in five months at Portsmouth, Va., in 1942, attracting nation-wide attention for this accomplishment.

SAVINGS up to 25% of your Finishing Cost!

with a G. M. No. 5 PRESSURE SPRAY GUN

Patented Nozzle Reduces 25% Mist and Saves Paint

Better atomization, greater speed, G. M. Gun lays material more uniformly on object. Excess mist eliminated; paint saved. Patented nozzle with combination of external and internal atomization gives double breakage; finer atomization. From 1/8-in. to full wet 14-in. fan spray. Very moderate price. For details write Dept. L.

G. M. MANUFACTURING CO.
Engineers, Mfrs. of Complete Spray Equipment
216 N. Clinton St. Chicago, Ill.

NOW *Available Again!*

BALLOU'S
Imitation Chrome Aluminum Paste

Will produce a beautiful imitation of a real plated finish when used in conjunction with quick bake synthetic or varnish type vehicles.

Send for sample and prices

EDWARD C. BALLOU CO.
6 Varick Street
New York 13, N. Y.

Back to Coal—Despite many innovations in diesel and electric power, the Pennsylvania R.R. has introduced a revolutionary coal-burning steam locomotive. Built by Baldwin and Westinghouse, it can pull a full-length passenger train at a speed of 100 miles per hour.

This new monster is powered by a direct-drive turbine engine which is designed to develop 6900 horsepower. More than 1000 chromium steel blades—some of them less than 1-in. long—have been built into the turbine to drive the engine forward. A research project is now under way in the railroad's shops with the hope of completely eliminating smoke from coal-burning locomotives.

* * *

Acid-Proof Glass—Glass that will successfully withstand hydrofluoric acid has been developed by the American Optical Co. Many vital industrial uses are suggested immediately for this interesting product; for example, acid-proof lenses for safety goggles, window panes for chemical laboratories, and shipping containers.

This triumph was achieved by substituting phosphorus pent-oxide for the customary sand in the routine glass formulation of lime, soda and sand. An important consideration is the fact that the new product can be manufactured in any glass factory.

* * *

Improving Plywood—Experience obtained in fabricating plywood airplanes and P-T boats will be applied in the years ahead to many peacetime products. In the opinion of Cecil N. Batsel, of the Radio Corp. of America, homes, furniture and other items of glued wood construction are destined to be stronger, longer lasting and more economical.

The two outstanding factors in this development are the perfection of electronic power heating techniques, and improved adhesives. By use of conventional methods, nine hours are required to raise the temperature at the center of a 6-in. block of wood to 280° F.; electronic power will do the work in *four minutes!* At the same time, some of the new impregnating resins are waterproof and mildew-proof. The finished job in many cases, says Batsel, is so attractive that it will eventually replace expensive imported hardwoods for many applications.

* * *

Simplified Cooling—With the last two of a series of six recent patents issued to the Carrier Corp., the firm now possesses the facilities for a new approach to special problems in air condition. In the opinion of Dr. Willis H. Carrier, chairman of the board, wide vistas of human progress may now be opened up.

DUST AND LINT
ARE THEY SLOWING UP YOUR PRODUCTION? IF SO,
Detroit Handy Tac Rags
will solve your problem. Remain tacky indefinitely. Non-combustible. At your Paint Dealer or write to Manufacturer.
DETRO SALES CO.
418 NORTH SAN PEDRO STREET
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MISKELLA
INFRA-RED OVENS & APPLIANCES
INSULATED - REFLECTIVE - SECTIONAL
BY
INFRA-RED ENGINEERS & DESIGNERS
1633 E. 40th STREET - CLEVELAND, OHIO
We sell lamps, too!

The improved system takes up less room, eliminates return air ducts, and reduces the air supply ducts to conduits no larger than a plumber's waste pipe. In addition any number of rooms, supplied from a central conditioner, can now be heated or cooled individually to fit the requirements of various occupants.

* * *

Salesmen Needed—"We cannot have mass production without mass orders, and we cannot provide millions of jobs without millions of orders." That's the way the postwar picture looks to William E. Holler, general sales manager of the Chevrolet Division of General Motors. He speaks with some authority, being the man responsible for the past sale of 22 million vehicles.

Holler believes that a great army of approximately four million salesmen will be required to make the personal contacts and get the signed orders that will create postwar production. He points out that many surveys have indicated a "wait and see" attitude on the part of millions of consumers, and they are the ones who must be convinced to get peacetime economic activity on a high level again.

* * *

For Visitors—Readers of INDUSTRIAL FINISHING who are planning a trip to New York are invited to make use of our free service in obtaining radio broadcast tickets. Drop a line to: *Lawrence H. Singer, 130 West 86th Street, New York 24, N. Y.*

Among the cooperating sponsors are: America's Town Meeting (Reader's Digest); Double or Nothing (Pharmaco Inc.); Metropolitan Opera Presents (Sherwin-Williams Co.).

FOR CHAPPED, CRACKED, OR DRY SKIN—

M. S. A. FEND-X

INDUSTRIAL SKIN CONDITIONER

Use this modern cream to keep your workers' skin in healthy condition—avoiding sore, chapped hands that hamper production! FEND-X supply to the skin specially-formulated ingredients to offset effects of industrial and winter exposure—proved *on-the-job*. Easy to use, non-greasy, emollient.

WRITE for descriptive literature on FEND Barrier Protection creams and lotions.

MINE SAFETY APPLIANCES COMPANY
Braddock, Thomas and Meade Streets
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WOOD FINISHING

A Book of Formulas and Detailed Instruction Methods, Tools, and Materials, Period Finishes, Staining, Filling, Varnish, Painting, Enameling, Glazing, Lacquers.

WOOD Finishing in General; Preparation of New and Old Surfaces; Stains in General; Factory Prepared Stains; Water Stains; Aniline; Chemical Water Stains; Color Pigments; Dyewood; Spirit Stains; Oil Stains; Stain Mixing; Brushing and Procedure; Wood Fillers; Varnish and Shellac; Varnishing. Rubbing, Polishing; Varnish Defects; Lacquers; Wax and Oil Rubber Finishes; Trim; Working Operations; Woods; Brush Graining; Decorative Wood Finishes; Repairing Damaged Finishes.

360 Pages, Cloth. Price, $2.00

INDUSTRIAL FINISHING
1142 N. Meridian St. Indianapolis, Ind.

NALCO

Infra-Red Ray Lamps

Best for Infra-Red Ray Baking and Drying

Carbon Filament Lamps, service proven, available in Inside-Silvered (self-reflecting) or in Clear Glass types. Write for details.

North American Elec. Lamp Co.
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MIRACLE

5 Gallon BLUE BOY Model

PAINT REJUVENATOR

Restores Paints, Lacquers, Enamel Products and Pigment Primers, to original consistency in 3 to 10 minutes without opening the can. Available for Round or Square 5-gallon cans. Explosion-proof electrical equipment if desired. Also other units from ¼-pint to 50-gallon drum capacity available. Originators of Paint Rejuvenating equipment — ten years — thousands of satisfied users.

Miracle Paint Rejuvenator Co.
127 E. 9TH STREET ST. PAUL, MINN.

Remove Production Line Dust, Lint, and Sand Particles with this Soft Tacky Cloth before applying finish.

CRYSTAL TACK RAGS

Gross Lots Available Thru Paint Dealers or from the Processor.

Baughn Chemical Products Co.
8151 So. Crandon Ave., Chicago 17, Ill.

New Broadway shows of special interest include: Billy Rose's spectacular musical, "The Seven Lively Arts"; "Dear Ruth," a merry comedy; and the tense melodrama, "Hand in Glove."

Berry Brothers Receives Third Army-Navy "E" Award

Berry Brothers, Inc., Detroit, Mich., has received its third Army-Navy "E" award in recognition of continued outstanding performance in the production of war materials. Robert P. Patterson, Under Secretary of War, told the company by letter of this new honor.

Berry Brothers' paint products are used on America's most famous fighters and bombers, as well as on many other war time products, such as engines for invasion craft and rocket shells.

Maas & Waldstein Opens Office in Boston, Mass.

The Maas & Waldstein Co., Newark, N. J., announces the opening of a New England office at 6 Jersey St., Boston, Mass., under the supervision of George F. Melanson, sales engineer. Mr. Melanson's territory includes Rhode Island, eastern Massachusetts, lower New Hampshire, and Maine. Equipment to demonstrate finishing materials and help solve production problems has been installed in the Boston office of the company, as an aid to New England users of finishes.

New Detergents Company Formed

The Optimus Detergents Co. has been organized and is in operation at Matawan, N. J., manufacturing industrial detergents and developing new cleaning methods for industrial use in its research laboratory and pilot plant.

The Optimus Detergents Co. will also have available the facilities of its associate, Optimus Equipmest Co., so that cleaning methods to be followed can, where needed, be utilized and developed with the aid of specialized cleaning equipment.

The Optimus Detergents Co. and Optimus Equipment Co. function in close affiliation with the Hanson-Van Winkle-Munning Co., of Matawan, N. J.

Oven Conveyor Lubrication—There are some places where lubrication is a tough problem. One of these is found where baking and drying of finish coats is performed in ovens, or infra-red tunnels, served by an overhead chain conveyor. The chain links must receive a special heat-resisting lubricant if they are to operate with the minimum of wear, and they must receive that lubricant positively while they are in motion. Special lubricators have been applied to hot-zone services such as this, which are controlled by a solenoid valve, so the lubricator will start when the conveyor chain starts. The volume of lubricant applied is readily adjusted, and lubricant is applied to every chain link on every trip around. Trolley wheel bearings can also be automatically lubricated with a different type of lubricator.

Hot Marking, Special—Distinctive marking of enameled, painted or otherwise finished parts and pieces with heat, can be practiced with full success if and when the heat and the pressure are under full control. Special marking machines, designed for hot stamping on finished work, not only do the work well but do it at a high rate of speed. Numbering and calibrating are handled on units of this kind, as well as other forms of marking.

In the postwar period, it remains for us to consolidate our scientific gains, to continue our advance in industry, and to create a permanently fruitful economic structure. The means are at hand. It is science, it is investment in tools and equipment, and it is the American people together that can put these means to use.

LACQUER SALES ENGINEER.

Aggressive and eminently successful Eastern manufacturer, long-established in production of industrial lacquers, adhesives, synthetic and allied coatings and finishes, possessing outstanding acceptance in many specialized industrial fields offers an exceptional opportunity for substantial income and advancement to an above-average, free-to-travel salesman. Chosen candidate will probably be aged at or near 35 years, preferably with some technical background and otherwise now qualified to sell and service existing industrial customers in the state of Indiana.

Of equal importance, prospective customers in this territory should readily respond to the performance of present and future products when backed by the talents of the representative now sought. College graduate preferred, but not essential; residence in or near Indianapolis desirable.

Selected applicant will receive thorough specialized training in our laboratories and in the field. Products resulting from long-conceived and ambitious post-war plans now ready for exploitation. Competently staffed research and control laboratories, timely advertising program, effective point-of- sale assistance and well-rounded headquarters cooperation at disposal of chosen representative.

Every candidate confidently believing that education, experience and sales-technical personality conform to these "specifications" may obtain formal application by addressing card or letter to IF-168, care Industrial Finishing Magazine, 1142 N. Meridian St., Indianapolis 4, Indiana.

All replies completely confidential. Our present employees informed of this announcement. Non-interested readers of this ad are invited to refer this opportunity to anyone qualified and interested.

METAL CLEANER—SALES SERVICE MEN WANTED

We have several excellent opportunities available now and postwar in this rapidly expanding department of our business.

Apply by letter giving details of your experience.

THE COWLES DETERGENT CO.
7016 Euclid Ave., Cleveland 3, O.

Classified Advertising

Rate: 50 cents per line per insertion—minimum $1.50

POSITION WANTED

As direct factory field representative. Experienced in all types finishing and coating processes. Good working knowledge of finishing materials. Will ing to travel. Address IF-165, care Industrial Finishing.

SALESMAN WANTED.

Industrial salesman for northern Ohio industrial trade, who is acquainted with Lacquer and Synthetic Finishes. Established trade, weekly drawing account, monthly settlements. Address IF-164, care Industrial Finishing.

WANTED.

Experienced Industrial Finishing salesman for City of Chicago, by moderate-size aggressive young organization. Give detailed experience and qualifications. All replies held strictly confidential. Address IF-145, care Industrial Finishing.

INDUSTRIAL FINISHING SALESMAN.

We have an opening in our organization for salesman calling on the Industrial Finishing Trade in the Eastern Ohio, Western Pennsylvania, and West Virginia territories.

We desire a representative who is thoroughly familiar with metal and wood finishing. We manufacture a complete line of industrial finishes including paint, varnish, lacquer, synthetic enamels, stains, fillers designed for all types of metal and wood.

Your reply should include your past experiences and qualifications. Such information will be considered strictly confidential. Address IF-163, care Industrial Finishing.

ELECTROPLATING & FINISHING EXPERT

Situation Open—Thorough knowledge and broad experience in electroplating and metal finishing processes. Wanted to work with well established sales and service organization manufacturing products extremely essential in all kinds of production, processing and maintenance work. Location N. Y. C. Must be willing to travel. Give full details. Address IF-166, care Industrial Finishing.

AIRCRAFT MANUFACTURERS!

Available: Services of a paint chemist and technician, 32 years old with 11 years' experience in development, manufacture, and industrial application. He can handle men and head up your finishing department. Your offer of such a position with good postwar prospects will bring full particulars. Annual salary $5,000. Address IF-162, care Industrial Finishing.

SERVICE MAN WANTED.

We require the services of a man thoroughly familiar with all phases of wood furniture finishing. One who is qualified to demonstrate our products, who is a good color-man and who has initiative and personality. This is an excellent opportunity for the right man. Please furnish full particulars regarding past experience, present employment, draft status, etc. Address IF-160, care Industrial Finishing.

PRODUCTION MAN

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WILL BUY SPRAY PLANT, IN OPERATION

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Situation Open—Thorough knowledge metals, broad experience in metal manufacturing and finishing processes. Salesminded to assist sales and service organization on problems arising in field. Our products extremely essential in all kinds of production, processing and maintenance work. Location N. Y. C. Willing to travel. Give details, experience, age, etc. Address IF-167, care Industrial Finishing.

WE BUY DIRTY SOLVENTS.

Don't throw away spent cleaning thinner, degreaser residues, etc. Send us a sample for quotations. We also reclaim for customers. DYTEX CHEMICAL CO., 267 Plain, Providence, R. I.

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We can see with the naked eye that the Payroll Savings Plan provides the most stable method of war financing! Under the X-ray of sound economics other important advantages appear.

A check on inflation, the Payroll Savings Plan helps industry to build the economic stability on which future profits depend. Billions, invested through this greatest of all savings plans, represent a "high level" market for postwar products. Putting over this plan *together* also establishes a firmer, friendlier relationship between management and labor.

To working America the Payroll Savings Plan offers many opportunities. Through this systematic "investment in victory," homes, education for their children and nest eggs for their old age are within the reach of millions.

These benefits to management and labor are national benefits. Instilling the thrift principle in the mind of the working men and women, the Payroll Savings Plan assures their future security—and is a definite contribution to the prosperity of postwar America!

The Treasury Department acknowledges with appreciation the publication of this message by

INDUSTRIAL FINISHING

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★ To most of us it's a year of hope and fear—hope that the war will end, and fear for the safety of a beloved one. To us here at Advance it means another year of OPPORTUNITY. Yes, we are glad of the opportunity to render another year of SERVICE to our many friends and customers engaged in finishing war and civilian products.

ADVANCE PAINT COMPANY

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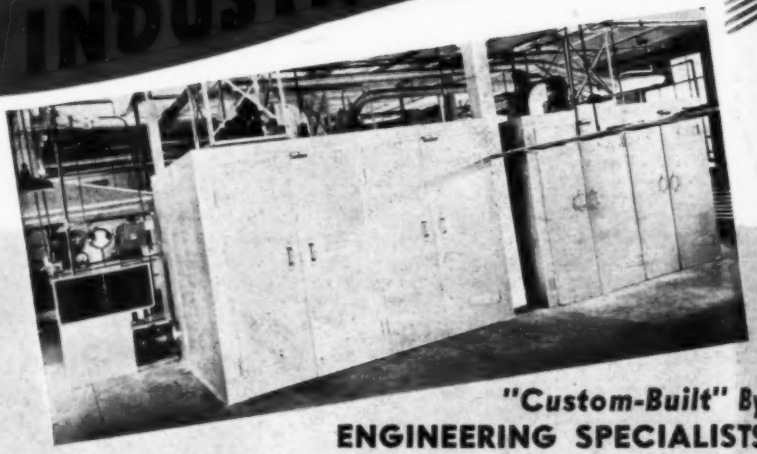

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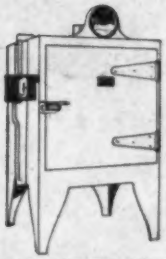

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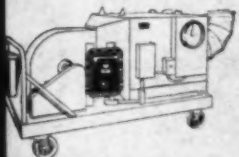

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automatically controlled designed especially for use in the Rayon and Chemical industries.

Kirk & Blum Industrial Ovens are designed and installed to meet *individual requirements* in product finishing.

The long background of experience, expert knowledge, and scientific approach of the Kirk & Blum Engineering staff is your positive assurance of high oven efficiency and economical operation.

Kirk & Blum specializes in oven installations of *all types* — continuous conveyor drying and baking ovens, core baking ovens, laboratory ovens, etc. These systems are guaranteed to speed production, cut fuel and labor costs, conserve floor space, and promote *maximum safety*.

Write for Booklet, "*Industrial Ovens*," giving full information. Address The Kirk & Blum Manufacturing Co., 2831 Spring Grove Ave., Cincinnati, Ohio.

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